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Editor's Note. The *Mechanical Engineering* department of this paper will be under the charge of Mr. ZERAH COLBURN.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., NO. 9 SPRUCE ST.

Saturday, June 18, 1853.

Marietta and Cincinnati Railroad.

The whole of this road is to be immediately placed under contract. Its line is the longest under one charter of any in Ohio, and, when completed, the road will be one of the most magnificent works of the kind in the United States. Ample means are now provided for the whole line, and the work of construction will be urged forward with all possible dispatch; and the character of the parties having it in charge is a sufficient guarantee that the work will be pushed forward with energy and vigor.

The original design for a road extending from Cincinnati to Marietta, on the Ohio, nearly on the same parallel, and cutting off the long bend of the river. The contemplated outlet to the seaboard was through the Baltimore and Ohio railroad, of which *Parkersburg*, on the Virginia side of the Ohio, was one of its proposed termini. Since the plan of the road was first undertaken, the great Penn. road has reached the Ohio, and the advantages of a connection with this work, as well as

the Baltimore and Ohio road, became so apparent that the company, and wisely we think, determined to push their line to Wheeling, an important town on the Ohio, and which is now in connection by railroad with Baltimore, and is soon to be with Philadelphia, by a very direct line of road. The above road will form the Ohio Trunk for both the Penn. and the Baltimore and Ohio roads, and will constitute one of the shortest lines between Cincinnati and the Atlantic ports.

We think the extension of the road from Marietta to Wheeling to be not only a good project in itself, but as adding largely to the value of the whole line. There is now no *northern* and *southern* road through the western half of Ohio, while in the eastern half there are some four or five in operation and progress. That portion of this road north of Marietta, will form just the avenue wanted for the large trade and travel between the Lakes and southern Ohio, and Kentucky. It will also be a convenient route for business men, by touching the points of concentration of trade. At Wheeling, a junction will be formed with the Cleveland and Wheeling road, a greater portion of which is opened. On the southern portion of the line, a junction is to be formed with the Scioto and Hocking Valley road; which last will form a junction with the extension east of the Maysville and Big Sandy road, and through this with the railroad system of Kentucky. In this manner the Marietta road will become the connecting link between important systems of roads lying beyond either termini, with the additional advantage of having no prospect of any immediate rival.

The road is strong in local support, which is a good indication that it will enjoy a lucrative traffic. The greater part of the country traversed by this road, possesses an excellent soil; parts of it are among the old settled and richest portions of Ohio. Ross County in particular is hardly inferior to any one in the State in the excellence of its soil, the extent of its productions, and in the wealth of its inhabitants. That portion of the route having poorest soil, abound in coal and iron ore, of the best quality, and from which a very large traffic is anticipated. Cincinnati is already supplied with coal from the coal fields of southern Ohio, from which a large portion of the State is to be supplied with fuel. The Marietta road must be one of the

most important channels through which the products of the mineral region to find their way to other portions of the State.

The road will be 237 miles long, and it is estimated to cost \$5,856,325. The available stock subscriptions already secured amount to \$2,800,000. This sum includes subscription of \$750,000 made by the Pennsylvania railroad company. This subscription by a company under such careful and prudent management as is the latter, may be regarded as high testimony in favor both of the parties having in charge, and the prospective income of the Marietta road, and has, as the act is entitled to, exerted a strong influence in giving to the securities of the company the high credit they now enjoy.

The above road will prove a vast benefit to the whole of south-eastern Ohio, which, up to the present time, has been without the advantages of railroad communication. Its cost is estimated at \$24,000 pr. mile. We believe its stock will be a paying one under all contingencies, and that, consequently, its securities must prove an excellent investment for capitalists.

Grand Trunk Railway of Canada.

The Atlantic and St. Lawrence railroad company formally voted at a meeting of the stockholders, held at Portland on the 10th inst., to execute a lease of their road to the Grand Trunk railway of Canada. The resolution authorising the lease is as follows:

Voted. That Alexander T. Galt, Esq., be and he is hereby authorised and empowered in behalf of the Atlantic and St. Lawrence railroad company to enter into a preliminary contract with the Grand Trunk railway company of Canada, for a lease of the Atlantic and St. Lawrence railroad and all its equipment and property to the said Grand Trunk railway company, in perpetuity, or so far, and to such extent, as the charter of this company and the laws of the several states through which it passes will allow;—upon the general basis following, that is to say,—That the said Grand Trunk railway shall pay six per cent per annum in half-yearly payments on all the outstanding stock of the company and assume all the liabilities of this company upon mortgage, contracts, or otherwise; the organization of the company and all their obligations to the several states aforesaid, under the laws of the same, to be preserved and to remain inviolate.

Mr. Galt who was present, addressed the meet-

ing at some length. His remarks were reported in the *Argus*, as follows:

Mr. Galt commenced by referring to the great importance felt by those interested in England, in securing an uninterrupted line of railway in the west. Of the immense obstacles that had been contended with and overcome. Of the favor with which this project was viewed in Canada, both by the government and by the management of the road. The scheme is one of a most momentous character.—The plans must be laid for the great future rather than for the present. The scheme itself involved the most gigantic outlays. No single company could consider them for a moment. It was only a stupendous combination as this proposed to be, that could steadily contemplate them and master them. The construction of the bridge even, over the St. Lawrence would cost \$7,000,000!—This bridge must be constructed, or the whole scheme would fall through. When in London two great questions were presented; one, this immense bridge, the other, can the continuous line be secured. If either of these fail, we need go no farther. Happily, they could both be settled in aid of the great plan.

As to the terms of the lease, they are simple and explicit. The Grand Trunk railway assumes all the liabilities of this road and agrees to pay 6 per cent semi-annually to the stockholders, and proposes to commence on the first of July next.—The Canadian company have no interest guaranteed to them. They take their dividends from the working of the road. Mr. Galt thought the whole line would pay six per cent. The completion of this arrangement will make Portland the outlet of *eight hundred and nine miles* of railroad—and freight from Lake Huron will reach here without breaking bulk. The arrangements for the hire of steamboats are absolutely necessary. In connection with a line of boats from England or Ireland to Portland, a ticket may be taken from Trieste, Havre, etc. to the terminus of the road. The capital embarked is immense.—\$50,000,000!

Mr. G. said, it appears more likely to-day that the road will be extended West from Lake Huron than a few years since it did that we should meet here on this business to-day. The fruition of this plan will make Portland a principal city for steamships. It will really verify the Utopian idea of making a ferry of the Atlantic. In addition to all this, (said Mr. G.) the European and N. A. railroad will undoubtedly be carried thro' to Halifax, —giving decidedly the shortest route from Europe to the interior of this continent. As to the progress of the work, he would state that the whole line from Sarnia to Montreal and Quebec, is under contract. Twenty per cent has been paid in, and the road will unquestionably be completed from Sarnia to Montreal in three years. It will take a year or two longer to finish the Bridge, which is to be one of the most stupendous enterprises in the world, and an attraction sufficient, he trusted, to induce the stockholders of this road and the citizens generally, to visit Montreal. It is to be of iron, on stone piers, with spans of 220 feet each, and of height sufficient to allow free passage underneath, of the tallest craft on its waters.—There will be no less than two thousand five hundred miles of railroad connected with that Bridge and Montreal.

If the stockholders should vote to lease the road it would have effect to release the capital of Portland, &c., which they have so generously put into it—six per cent being secured on it, they may realize when they please on their stock—and thus can again use all the means which are to be demanded for the improvements which will be required by the immense strides she will make in growth.

At the conclusion of Mr. Galt's remarks, the following complimentary resolutions were unanimously passed:

Resolved, That in carrying forward the great work of an international line of railway from the harbor of Portland to the St. Lawrence at Mont-

real, and its further extension under one management to the extreme limit of Canada at Lake Huron; the stockholders of the American portion of the line have, from the earliest inception of the undertaking—during all the successive stages of its progress, and more especially in that most critical period of its history, when the line was placed under contract in 1849, and in the recent negotiations by which its entire capital has been advanced to a permanent six per cent paying stock, have regarded with unqualified admiration the efforts of ALEXANDER T. GALT, Esq., toward carrying out this work—under whose guidance, and thro' whose instrumentality chiefly it has been accomplished,—and that the best thanks of the stockholders are hereby tendered to him therefor, and that the Directors be authorized and instructed to present to Mr. Galt such a testimonial as may be deemed suitable, to mark our sense of his efforts and ability in this behalf.

The stockholders also confirmed the contract entered into in March last, by which a bonus of \$10,000 per year, for a period of ten years, was agreed to be given to Robert McLean, on consideration of their running their line of steamers to Portland, during the winter months.

The above is the closing act of one of the most successful attempts in railroad construction, ever achieved in this country. Nearly eight years since the city of Portland, containing a population of not over 17,000 souls, undertook,—in obedience to the prevailing idea of the time, that the degree of the commercial progress of our eastern cities, depended upon the intimacy of their relations with the fertile regions of the west,—the construction, single-handed, of a railroad to the boundary line of Canada, a distance of 150 miles, and costing over \$5,000,000, expecting to meet at that point its Canadian complement, commenced at about the same time. To construct the road, it became necessary for the city to lend its credit to the work, to the extent of \$2,500,000, or more than \$100 to each individual. For a long time the scheme was considered as in the highest degree visionary, and its accomplishment impossible. But by dint of patient industry and perseverance, the Portland people pushed the work slowly and steadily forward, in the face of great physical and financial difficulties, and they now find themselves rewarded, not only in having accomplished their original project, the whole cost of which is a paying stock, but is making their city the ultimate terminus of a magnificent system of railroads which is to cost some \$50,000,000! Never in the history of railways in this country, have similar efforts been crowned with such wonderful success.

The entire line, from Montreal to Portland will be opened for business about the middle of July. In grades, alignment and distance, it is by far the best avenue between the St. Lawrence and the Atlantic. We believe it must at once enter upon a good business. We see no reason why the state of Maine, and to a very considerable extent, the British lower provinces, will not receive the supplies of western produce over this road. Should such be the fact, a new business will at once be developed, equal to the full capacity of the road. Independent of the *through* traffic, the route traversed is already supplying a very large local business, which is rapidly increasing. On the whole we believe the Grand Trunk has not made a bad bargain in assuming the Portland and Montreal road, and it is certain that the city of Portland has been remarkably fortunate in becoming the Atlan-

tic terminus of the Canadian system of improvements.

Railway Accidents--their Causes and means of Prevention.

(Continued from Page 275.)

It is to be observed that an improper use of the discretion allowed to the driver not only endangers the safety of the train which he himself is conducting, but in a greater that of the trains in front and rear of his own train. It might be impossible to provide a time table for these trains for any length of time before the trains are run, but it is worthy of consideration whether the responsibility as to the hours at which trains are to pass along each railway or part of a railway in either direction, should not be placed upon one person, who should be a responsible officer of the Company, without whose permission no engine or train should be allowed to pass along the railway.

The attention of the late Board of Commissioners of railways, and of your lordships, has been particularly directed to this subject, by accidents that occurred during the year 1851.

Upon the occurrence of an accident of a very serious nature upon the Great Western railway, where it appeared that an excursion train had been along the line of railway, unprovided with a time table, the Commissioners pointed out to the company how desirable it is, not only on account of the comfort and convenience of the passengers, but also with a view to their safety, that these excursion trains, in which numbers carried are so very great, should be conducted with the utmost regularity; and that arrangements should be made for them along the lines on which they travel, so that their hour of arrival and departure at all stations should be fixed and known beforehand.

In like manner, in communicating to the London and North Western railroad company, the result of the investigation into a serious accident that occurred at Bicester, the Commissioners urged upon the Directors the great necessity of working their excursion traffic with the utmost regularity. They observed that these excursion trains are generally advertised some days before the public are conveyed by them, and they suggested that there could, consequently, be no difficulty in arranging so that they might be worked throughout their journey to time tables, in the same manner as the ordinary trains, and supplied in every respect with all requisites to secure them as safe and regular a journey as those trains. In reference to this subject, it is right to observe, that the manager of the London and North Western railway, whose experience in these matters must give great weight to his opinion, considered that the nature of the traffic during the extraordinary season of 1851 rendered it impossible to fix any specified time for the transit of these trains. The question is one, however, which requires constant and careful consideration, as it cannot be doubted that the taste for this description of amusement having been once acquired in the country, it will continue to a very great extent.

The preceding observations, which are equally applicable to several other cases in which accidents have occurred, have reference particularly to those accidents in which one of the elements concurring to produce them has been the absence of time tables; this is especially to be observed on some railways with reference to goods and mineral trains; but another circumstance which tends alike to produce danger is, that when time tables are provided, the trains are not worked with punctuality to the times denoted in them. This want of punctuality may arise from several causes:

1. From an improper arrangement of the times in the tables, either from not taking sufficiently into account the character of the line itself, or the detentions to which particular trains are subject at particular stations. The remedy in this case can always be applied by re-adjusting the time tables experimentally, until they suit the condition of the line and the requirements of the traffic.

2. From the motive power not being sufficient

to allow of the appointed times being kept. The deficiency may arise either from the excessive weight of trains or from atmospheric causes, such as damp or frost, by which a bad state of rails is induced, and the adhesive power of the engines diminished, or it may arise from very boisterous weather. The remedy in this case is equally evident; no engine should be tasked to do more than it has adequate power to do with certainty at all times, and in all ordinary conditions of weather.—It being impossible in a long journey to calculate upon the changes and vicissitudes to which a train may be subject from the weather, it would appear but right that the maximum of load to be drawn by any given engine should never exceed the maximum of power to be depended upon under all conditions not of an extraordinary character. On this point, it seems hardly necessary to observe that the locomotive engine is a machine which will permit of very great accuracy in the performance of its work, and will, if not unfairly tasked, work with as much certainty as a well regulated time piece.

The simple method for reducing such rule to practice is, that companies should ascertain, either experimentally or otherwise, this precise load, with reference to the conditions of the particular railway, and the nature and speed of the traffic each engine is intended to convey, which might be registered and known by the driver of the engine, and should, on no account, be exceeded. Such a provision corresponds with that usually inserted in the by-laws of railway companies, by which they book passengers at road side stations, or stations intermediate between the terminal stations, conditionally upon there being sufficient room for them in the trains.

3. Want of punctuality may arise from purely accidental failures of machinery, such as the fracture of some part of the engine. These causes of delay appear to be comparatively of very rare occurrence.

It only remains to advert to the cases in which inattention to regulations or carelessness of the servants of the company are involved. It would appear that in 28 out of 41 cases, into the circumstances attending which investigations were made, considerations of this nature were involved.

These may be divided into two distinct denominations:—

1st. Occasional. Those caused by inexperience or carelessness of individuals.

2d. Habitual. Those caused by general inattention to regulations on the part of the servants of the company, exhibiting, as a natural consequence a laxity of discipline throughout the whole management of the railway.

On this subject, as to which it is very difficult to give any accurate statement, and to separate the two classes, it appears that there is much ground for apprehension that on some railways the disregard of regulations is habitual, and the general discipline lax, from the fact that breaches of the regulations issued by the directors of railway companies for the guidance of their servants are of very frequent occurrence under the immediate supervision of the superior officers of the railways, and in which many of them participate, or of which at any rate, they are cognizant. This may be induced by the regulations themselves not being very explicit, as appears to have been the case in some of these accidents, as, for instance, the collision that occurred on the Eastern Counties railway at Ponder's End, on the 8th of January, 1851; or by defective supervision and inspection on the part of the railway companies over their servants, such as would appear to have been the case upon the Midland railway, as shown by the accidents, the reports and correspondence relative to which are to be found in appendices 48 and 53.

Discipline upon railways is of the greatest importance both to the public and to the companies, who are subject by the occurrence of serious accidents, to great losses, and to the payment of compensation to injured persons; but notwithstanding the direct interest which the companies

thus have in maintaining discipline, and enforcing the regulations which they themselves have considered necessary for the safe conduct of traffic upon their lines, it has been the duty both of the Commissioners of railways and of the Lords of this committee, to animadver in some cases in very pointed terms upon the neglect of these regulations.

It is a subject to which it is desirable that the attention of railway companies should be especially called, both as affecting the safety of the public, and the profits of their undertakings, as the only security the public can have in this respect is in the companies themselves, who alone have the power, by the adoption of carefully considered regulations and careful supervision to enforce an efficient state of discipline.

It appears advisable, in considering this question that some few observations should be made upon a proposition which is considered by many as holding out a prospect of obtaining a greater degree of safety upon railways, viz: to prescribe an interval of time, to be observed upon all railways between succeeding trains, and which should at all times be strictly enforced.

This proposition, as has been stated above has been adopted on some railways, but for the reasons there given, does not appear alone to afford a sufficient security for the safe working of a railway. There are other reasons why any rule as to this interval could not be generally applied. The object to be gained in fixing an interval of time between trains following each other on the same line of rails is, that upon an accident occurring by which the stoppage of a train is occasioned, and the line of railway obstructed there shall be sufficient time to admit of a signal being sent out to protect the rear of the train that is stopped. This time must depend on the nature of the signal. In fine weather a light or a flag is employed, according as to the necessity for its use may arise, by night or by day, which may be seen for a considerable distance, provided the view be unobstructed either by curves or objects in the vicinity of the railway. In foggy or thick weather a detonating signal is attached to the rail, which upon being exploded by the passage of an engine, gives a loud report, and thus communicates the required signal to the driver.

This latter signal requires that the man, whose duty it is to fix it should actually have arrived at the place where the signal first becomes available and is therefore the most unfavorable condition under which signals could be applied.

Upon the people in charge of a train receiving a signal to stop, it is their duty to apply the means provided upon the train for arresting its progress with the greatest alacrity. The distance to be traversed by the train before it will come to rest will depend, first upon the alacrity with which the means are applied, and secondly, upon the extent of these means as compared with the weight and speed of the train, taking also into consideration the inclinations and curves upon the line and the condition of the weather.

The distance, therefore, from any obstacle at which a signal must be given in order to secure the safety of the traffic, requires to be ascertained with reference to each railway, and the weight of engines and trains in general use upon it, the speeds at which they travel, and the means for arresting their progress provided upon each train.

The interval between succeeding trains should be made up, therefore,

1st. Of the time consumed in stopping the first train.

2d. Of the time consumed by the guard or man who is responsible for applying the signals in going out to the required distance with those signals. This time, in a case in which considerations of public safety are involved, should be determined under the most unfavorable conditions in which the signals can require to be applied, such as a dense fog.

A liberal margin, should, however, be allowed in each consideration, in the interval so calculated, which will seldom be less than ten minutes, and

may be more. Upon railways where the means provided for arresting the progress of a train are very powerful, it might be reduced.

Few companies adopt a less interval than ten minutes; all, however, have rules by which it is imperative upon their servants to exhibit at all signal stations, the "Danger" or "Stop" signal for a certain interval after the passing of every train, so as to prevent at each of these points, which average a distance of not more than three miles apart on all the railways in this kingdom, a diminution in the interval considered necessary by the managers of the railways to be maintained between the trains.

In any regulations of this nature, as in all others that may be adopted, safety would still depend upon the vigilance of the servants of the companies, and the efficiency of the machinery.

From these considerations it appears manifest, that to prescribe a certain fixed interval of time, applicable alike to all trains, taking the responsibility out of the hands of the companies, would be improper, as each line with its gradients and curves, and the train arrangements in force upon it, would require separate consideration. To enforce upon all companies an uniform regulation in this respect, would, moreover, be unjust; for upon a line of light traffic, where trains do not succeed each other with great rapidity, fewer servants may be employed upon the trains, and fewer brakes used for stopping the trains, a longer interval of time being adopted, whereas, upon a line of heavy traffic railway companies occasionally may find it in their interest occasionally to station men within signalling distance along the line of railway, in order to save the same time consumed by a guard running out with and placing his signal when his train shall, from any cause, I have been obliged to stop.

The prescription of a minimum interval, as deduced from a line of great traffic, would tend to diminish rather than increase safety in travelling, as it might lead those companies which do not use the precautions employed upon the line of great traffic to adopt the minimum interval without examination of the data and details upon which it was founded, and so relieve them in a great degree of that responsibility which should attach to them.

Probably one of the best means that can be recommended for promoting the safety of the public upon railways is an extended use of the electric telegraph, by means of which the traffic upon a railway may be so worked that no two trains shall be upon the same part of the line between neighboring telegraph stations at the same time. All lines do not possess this adjunct to their establishment, which requires a considerable outlay of capital, and a large establishment of clerks. Upon some lines the telegraph stations are not sufficiently near to one another to allow of its being used for this purpose, so that, although the use of the telegraph may, no doubt be very much extended, its adoption upon all lines, and its employment in the manner here described, cannot be enforced.

Jeffersonville Railroad.

The new Board of directors of this road met yesterday, and organized by the re-election of W. G. Armstrong, Esq., as president. Much business was transacted, and amongst it the board resolved upon the immediate construction of the extension of the road from Edinburg to Indianapolis, and the president was ordered to advertise for proposals for construction; the lettings to be made on the first Monday in July, and to contract for iron sufficient for the track, to be delivered immediately. A resolution was also adopted, directing that a manifest should be transmitted to the Louisville agency immediately upon the arrival of each freight train, and that all freight bills should be collected by the Louisville agent, and that he should be kept regularly supplied with tickets, and control the sale of all tickets in Louisville.

The prospects and business of the road were shown to be in a highly favorable condition and daily increasing.—*Louisville Courier.*

Journal of Railroad Law.**AN IMPEACHMENT OF DIRECTORS.**

On the 9th of May an inquisition was commanded by the Coroner, at Hambleton, England, concerning the death of the engineer and fireman of the York and North Midland railway company, who had recently been killed, in consequence of the engine having run off the line. The Board of Trade directed their Inspector, Captain Galton, civil engineer, to take part in the proceedings on this occasion, and accordingly the Coroner availed himself of the evidence and opinions of the former, in investigating the facts of the case proper, for the consideration of the jury.

It seems that the speed of the engine at the time of the accident was 50 miles an hour. Capt. Galton did not consider it safe to travel the road in question—which he had well examined and found defective,—with a heavy engine at a high speed.

The Coroner submitted the following questions to the Jury. "Was the speed too high?" "Was there any defect in the engine or in the road?" If either of these questions are affirmatively answered, who is to be blamed? After an absence of 20 minutes, the jury brought in a verdict of *Manslaughter* against the directors.

Two of the jurors dissented,—but twelve of them the required legal number, united in the verdict above stated.

THE LIABILITY OF PRINCIPALS TO AGENTS.

The Court of Appeals of this state has affirmed the judgment of the Supreme court, in the case of *Keegan, vs. the Western railroad Co.*

This action was brought to obtain a judgment for injuries sustained by the plaintiff from the explosion of the boiler of a locomotive engine, on which he was fireman. The engine was known to the company to be defective before the explosion. A verdict for damages was returned.

This case illustrates the true nature and scope of the rule in respect to claims for damages as between principals and agents.

It is true that a principal is not liable to one agent or servant, for an injury sustained by him in consequence of the negligence of another agent or servant employed in the same general business;—and a principal would not, necessarily, be liable to an agent for damages occasioned by a defective engine. But principals are exonerated from liability under those circumstances only where the injury happened *without any actual fault or negligence of theirs*.

If an agent is injured by the misconduct of the principal, the former can recover damages, as in the case of any other wrong doers. The law requires that both the principal and the agent should faithfully discharge the respective duties belonging to their positions, or suffer a just penalty for neglect,—but beyond this, the liability of neither party is extended.

HOW LONG DOES THE LIABILITY OF A COMMON CARRIER OF GOODS CONTINUE?

Generally, this liability continues until the goods carried are duly delivered or restored. But to ascertain the precise time, when they are restored or delivered, is not always easy.

This point was examined by our Court of Appeals last April, in the case of *Miller against the Steam Navigation Co.*

The defendants were common carriers, between

New York and Albany, and received goods directed to plaintiff at Albany, "care of F. M. Adams, Albany," agent of a line of canal boats, to whom the goods should have been delivered to be forwarded. The goods arrived at Albany in the barge on the morning of the 17th of August, 1848, and were chiefly discharged from the barge to a floating vessel or warehouse kept by defendants in the Albany Basin, to receive goods, preparatory to their delivery to canal lines. But on the ensuing evening occurred the disastrous fire, by which Albany suffered for a time so severely,—and the float, barge and goods were consumed.

The Supreme Court rendered judgment for the plaintiff, and this was affirmed by the Court of Appeals.

It was held that there was no evidence to be drawn from the foregoing facts that the defendants intended to store the goods, but that on the contrary, they were placing them in a proper condition for delivery, and that they continued to be liable as common carriers for their safety.

Equation of Distance upon Grades.

The comparison of any ascending grade to its equivalent length of level, is made by engineers to show the extent of its relative mechanical and financial disadvantage. Its mechanical disadvantage involves known physical elements, and can be ascertained; but the financial disadvantage of an incline is measurable only by the increased outlay for operating and maintaining it, for any assumed service. It is in this respect that many "equations of distances," which are estimated with reference to the prospects of any particular line, are of no accurate and reliable or practical character; for in practice the expense of working some of the inclines estimated, may amount to ten times what would be inferred from their ascertained mechanical disadvantage. To suppose an extreme case: let a vertical rise of 35 feet occur at any point in the line of a road,—its ascertained mechanical disadvantage would be equivalent to an excess of from one to two miles of level line, while every one knows that to work such an ascent, that is to lift the traffic to that height, would cost more than the operation of ten miles of level road—while the advance of the train during the ascent, would be nothing.

The assumption of the mechanical resistance, as the measure of the disadvantage, is partial, not final. The expense for operating any incline for the through traffic of a line must tell the whole story, as the expenses cover the entire means employed to encounter this mechanical disadvantage.

The mechanical estimation of ascending grades is based upon the opposing element of gravity developed in their encounter. This is a fixed and ascertained sum for each and every inclination. The other resistances of friction, etc., are generally assumed as constant at the working velocities. By having the constant resistance per ton, the resistance of gravity, on any grade, may be added to it, and the whole tractive or adhesive power of the engine be divided by their sum, for the whole tons power of the locomotive on that grade.

The mechanical disadvantage of an incline is not the same in two cases, in one of which an engine is worked up to its full force, and where in the other, it is not so worked. The estimate made in the

equation of grades to levels assume that the engine is worked to its full capacity.

We will give some data, etc., which may prove useful in considering this question.

1st. *The power of the Locomotive.* Is its power to be measured by its adhesion or its traction?—It is usual to estimate the power of an engine by its weight, but its weight is only a medium for the application of its *tractive* power, and the medium may be in excess of the power exerted. The power of an engine is the effect of the steam transmitted to the circumference of the drivers. If the weight is in such equilibrium, or excess, as to insure a progress, without slip, to the drivers, under the maximum pressure of steam, then the *tractive* power is the limit of the power of the engine; if otherwise, the adhesive tenacity is the measure of the power. Most engines have a large surplus of adhesion, and the correct measure of the power of the engine is, therefore, that given by traction. The Philadelphia and Reading Company, and the Baltimore and Ohio railroad, have reduced the weight on the drivers of many of their engines by the substitution of trucks and leading wheels, and their engines do as much work as before. This change has, moreover, been made when the drivers were fitted with chilled tires, which have been considered as less efficient, in point of adhesion, than wrought iron tires.

The square of the diameter of one cylinder \times effective pressure per square inch \times length of stroke, in inches, and the whole product divided by the diameter of the wheel, in inches, gives the tractive power of any engine. As nearly all such estimates of draught are made with regard to freight trains, it is usually allowed to include only the friction and concussion resistances, and the resistance of gravity on grades. The friction resistance is usually estimated at $8\frac{1}{2}$ lbs. per ton of 2,000 lbs., the concussion resistance (increasing directly as the velocity) as 3 lbs. per ton, at 10 miles per hour; while the gravity resistance is always 3787 of a pound per ton of 2000 lbs., for one foot rise per mile. To these resistances must be added the friction of the engine and tender, equal to about 5 lbs. per square inch, on the piston of the engine, (with coupled drivers.)

Let us now ascertain the duty of an engine of 19 \times 22 inch cylinder, 43 inch drivers and steam at 80 lbs. per inch on piston; the computation to extend to the duty on a level and on a grade of 116 feet per mile.

The traction (exclusive of the resistance of five lb. per square inch on piston for engine and tender friction,) is 13852 lbs.—

This will draw 13852

$8\frac{1}{2} + 3$ = 1204.7 tons of 2000 lbs. each on a level.

13852

$8\frac{1}{2} + 3 + (116 \times 3787)$ = 249.9 tons of 2000 lbs. each, on grade of 116 feet per mile.

The resistance of the atmosphere, 15 pounds per square inch, should not be reckoned, except in estimating the expansive power of steam; the pressure taken from the safety valve showing only the excess of pressure above the atmosphere.

The resistance from curves are not, nor can they be, satisfactorily stated. Centrifugal force is one element of their resistance, but this is partly or wholly neutralized in a long train moving at a slow rate, from the inward pressure, or pressure

Milwaukee and Mississippi Railroad.

From a recent examination of the country thro' which the Milwaukee and Mississippi railroad is laid out, we are inclined to give this latter road a very great importance and bearing in connection with the Oakland and Ottawa road. Besides being connected by local ties of the strongest character, they have a general similarity in several of the most important characters. For instance, both form important links mutually dependent on each other in the straightest line and the shortest route between New York or Boston and the Great Pacific centre of commerce at San Francisco; both of these roads open up immense tracts of country for settlement and improvement, the whole trade of which their position naturally commands as surely as the lowest level diverts the course of a river, and draws to its channel the neighboring streamlets, as they seek the least unobstructed way to the ocean. Both of these roads also terminate at their eastern extremities in the best and most commodious harbors for shipping and navigation on the western lakes.

The Milwaukee and Mississippi road, however, has the advantage over our road in some respects, but they are of such a nature that they will contribute materially to the prosperity of the Michigan road while the latter will amply repay the benefits conferred by the travel and trade it will bring to Milwaukee from the east.

The Mississippi and Milwaukee railroad is laid out on a line little south of west, from Milwaukee to Janesville, a few miles east of which last named place the road takes a northerly direction to Madison. From Madison this road is to be consolidated with the Prairie du Chien road, the length of which is about one hundred miles due west, and will connect Milwaukee at that point with the upper waters of the Mississippi. The road from Milwaukee to Janesville, 71 miles in length, is already completed and in operation; we may say successful operation also, for the receipt of freight alone carried out of Milwaukee on one of the days of last week, we are informed, amounted to over \$400. That part of the road which will connect Milwaukee with Madison is about 40 miles in length, is now rapidly prosecuted, and will be completed about the first of next January. This portion of the road runs through a series of counties which compare very favorably in population with the counties of this state, through which runs the Central railroad. For instance, the five counties from Milwaukee to Madison, have the following population according to the last United States census:

Milwaukee.....	81,077	Rock.....	20,708
Waukesha.....	19,174	Dane.....	16,641
Jefferson.....	15,817		

Beyond Madison to the Mississippi, lie two counties which have the following population:

Iowa.....	9,530
Grant.....	16,170

Compare these figures with the seven counties of Michigan through which runs the Central railroad as follows, to wit:

Wayne.....	42,756
Washtenaw.....	28,567
Jackson.....	19,432
Calhoun.....	19,162
Kalamazoo.....	18,179
Van Buren.....	5,800
Berrien.....	11,417

And it will be seen that if these counties may be relied upon for trade and travel over the Canada railroad, by the projectors of that enterprise, the above named populous counties of Wisconsin may be easily counted upon for a proportionate travel, which will materially add to the receipts of both the Oakland and Ottawa roads, and also to the Canada Great Western road.

We are informed that the route of the road from Madison to Prairie du Chien is now being surveyed, and that it will be under contract by the 1st of August next. This, when completed, will form a still more extensive region of country for the Oakland and Ottawa road to draw its receipts from.

A glance at the map, to the eye of the most inexperienced, will show that the Mississippi and Milwaukee road terminus, at Prairie du Chien, will form as complete a trap to catch all the business and pleasure travel seeking the upper waters of the Mississippi and its tributaries, as could possibly be devised. The location is just at that point where the great river itself, after flowing from the north-west, begins to take a more direct course to the south, and will naturally cause every pound of freight, and every traveller destined for the eastern cities, to stop there, as the nearest point to the great eastern markets. And what is more advantageous still, from an examination of the whole region of country which will be drained by the M. & M. R. R., this Company may defy rivals, so far as the north-west is concerned. To the south of them there will be many rivals for the traffic of the west, but the connection once established between the Mississippi river and the Atlantic, by way of the New York Central line, the Great Western through Canada, the Detroit and Grand Haven, and the Milwaukee and Mississippi railroads, and the Milwaukee and Mississippi railroad Company may, if judiciously managed, defy all competition for that immense travel and traffic which is now in its infancy, but is fast growing in importance, from the mouth of the Wisconsin river along the upper waters of the Mississippi, and its tributaries, throughout nearly a thousand miles of river navigation, and which must eventually make the Milwaukee road a most profitable one. We do not wonder that Milwaukee is anxious for its completion. It must make her the great depot for Northern Wisconsin, Minnesota and Nebraska.

* * * * *

Nor among the aids which the Oakland and Ottawa road will derive from the Wisconsin road, should it be overlooked that the latter will run through one of the richest lead regions of the United States. According to the geological map accompanying the report of David Dale Owen, on the geology of the territory on the upper Mississippi, this road will pass directly through the lead bearing region, in the southern portion of Wisconsin. This will also add to the business of the two roads, and help to furnish it with the most valuable freight.

Taken altogether, advantages are presented by the Milwaukee and Mississippi road, as furnishing a business of the most important, lucrative and desirable kind to the Oakland and Ottawa road, the moment the latter is finished, and which must increase in the same ratio that the population and wealth of Wisconsin, Iowa, Minnesota, Nebraska, and of the whole north-west grows, more numerous and large, that we know of no investment in railway enterprise that promises better returns.—*Detroit Advertiser.*

The North Route to the Pacific.

Governor Stephen's corps of Engineers and suite have arrived at the initial point of their survey in Minnesota, and will start westward as soon as the Chief of the corps arrives.

The following plan of operations has been furnished by a member of the corps to the Madison Democrat for publication:—

The especial object of the exploration is, determination of a railroad route from the head waters of the Mississippi to Puget Sound. In consequence of the meagreness of the information in reference to the country to be gone over, particularly in the Rocky and Cascade Mountains, a general topographical survey must be had of these Mountains, between the 46th and 49th parallels, and of most of the intervening country, in order to determine the general course of the railroad, and furnish the data to guide the civil engineers in determining the route. The explorations involved are, therefore, as follows:

1st. *A general reconnaissance of the country.*—This will embrace the general features of the country, as mountain ranges and passes, windings of rivers and streams, their dividing ridges, prairie, and every thing which shall be necessary in the construction of a general map of the country passed over.

The result of this examination done by reconnoitering corps assigned to the special duty, will be to determine the most advantageous route to be pursued for the railroad, and to direct the movements of the party entrusted with locating it.

2nd. *The survey and location of the railroad.*—This will be along the route, resulting from the labors of the reconnoitering corps, and will embrace all the facts bearing upon the construction of the road. The route will be run by compass courses day by day, and measured by an adometer, and the results thus obtained, checked by the daily determinator of latitude and longitude, will form the base lines to which will be referred all objects observed in the survey.

3d. The decisive points which must determine the location of the road, are the mountain passes of the Cascade and Rocky mountain ranges; and it may occur that the location of the road between the two ranges, and for a long distance east of the Rocky mountains, must be suspended until these passes be examined and selected; and much of the general reconnaissance must be made after the selection of these mountain passes, which are the controlling points of the survey.

OBSERVATIONS.

1. Permanent posts, for one year, to be kept up for a longer period if additional appropriations are made.

2. Parties in the field to be continued 6 months, the permanent posts a result of their labor.

3. At permanent posts will be barometrical and hygrometrical observations, also, quantities of rain and snow will be carefully observed, also observations as to the wind and storms.

4. Parties in the field will all observe for temperature, winds and storms. Some four main parties will use the barometer, and, if practicable, make observations as to rain and moisture.

Railroad Accidents--What has been done may be done again.

Since the appalling calamity at Norwalk, the press has teemed with articles suggesting plans to prevent railroad accidents. Allow me to state a fact which throws some light on the subject. For nearly five years only one accident has occurred on the Utica and Schenectady railroad by which there has been loss of life; yet there have passed over that road in the meantime, more than *two millions* of passengers—nearly equivalent to one-tenth of the population of the United States. From this one and only accident, only three lives were lost, and some of them would have been saved had the persons obeyed the directions of the managers of the train. In this instance no blame whatever attached to the officers of the road. It was occasioned by a sudden washing away of the road in circumstances against which human foresight could not provide. It is questionable whether another railroad of equal length in the world can show so favorable a statement in regard to the loss of life as the Utica and Schenectady. This is attributable mainly to the noiseless vigilance and efficient management of Mr. Vibbard, than whom a more competent railroad superintendent cannot be found.

Amid the wholesale censure so freely lavished on railroad officers, it is but just that credit should be given where credit is due. That Mr. Vibbard merits the tribute of public gratitude for this able management, all who have observed his course will readily acknowledge. Great credit is likewise due to the directors, and particularly to Mr. Corning the president of the company. Mr. Corning has had the sagacity to see, what others in like positions are slow to learn, that instead of attempting to manage the details of a road in the directors room, one competent head should be selected for that purpose. The responsibility of running the trains being devolved on one man, and he a faithful and competent man, the Utica company have carried these two millions of people expeditiously, promptly and safely, and for this they deserve the lasting gratitude of the public. Now, why can not other roads do equally well? What has been

done, can be done again. Let the superintendent be faithful and competent, and he will see that men are employed who can be trusted, and he will also make it a point to see that every man is at his post and performs his duty. This is the secret and the whole secret of the success of the Utica company. It is useless to talk about more stringent rules or laws, or patent signals. The cause of accident lies back of all these. By the personal attention of the superintendent, every subordinate on the Utica road is made to feel his responsibility and every man *knows* that the first indication of carelessness or inattention to duty will be followed by a dismissal from the road.—*Schenectady Cabinet.*

The result upon the Utica and Schenectady road shows with what safety passengers *may* be carried. The degree of safety is a mere question of care. There is not the slightest necessity for the greater part of the accidents that occur, as a matter of economy, they should be placed beyond the bounds of possibility. A few hundred dollars a year would have placed an additional guard upon the Norwalk bridge, by which that accident would have been prevented. The company could have better afforded to have maintained 75 men constantly at that point than that the accident should have happened.

The Utica and Schenectady is a model road in more respects than one, and may be well taken as an example of the entire safety of railway travelers, upon well managed roads.

For the Railroad Journal.

Cincinnati, Union and Ft. Wayne Railroad.

This road lies between Union and Fort Wayne. It connects Fort Wayne and Cincinnati by railroad, and lies on the direct line between the two cities. It is 65 miles in length, and passes over a very level country, of rich soil, well timbered. The road will be of very cheap construction, and its stock very valuable for investment.

The company have had a preliminary survey of the route made, and the permanent location is now being made, and will be completed by the first of July. Contracts are already let, and the contractors ready to commence the work as soon as the final location is made. There will be two slight curves at intermediate stations, but with the exception of these, the road will be on an air line. The grades will be low. More than half the road will be level, and the maximum grade will not exceed 25 or 30 feet to the mile. But very little, however, will exceed 20 feet to the mile.

This road will connect at Fort Wayne, with all the railroads centering there, and at Union with all those centering there. Each of these places is destined soon to be a prominent railroad focus, and this is the only connecting link connecting these *foci*.

The Eaton and Hamilton road is about to be extended to Union. This, in connection with the Cincinnati, Hamilton and Dayton railroad, from Hamilton to Cincinnati, will form the direct line from Union to Cincinnati. It is finished and running from Cincinnati to Eaton, 51 miles; from Eaton to Union it is 32 miles; and 65 miles over the Cincinnati, Union and Fort Wayne railroad line, making 148 miles in all, from Cincinnati to Ft. Wayne—the shortest and best route between the cities.

By way of the Greenville and Miami railroad, now running daily between Dayton and Union, the Cincinnati, Union and Fort Wayne railroad will be brought into direct connection with Dayton, and through the Coal road now being constructed from

Dayton, with the coal region; and be the nearest and best route for Fort Wayne to supply itself with coal. Through the Greenville road, and the Dayton, Hamilton and Cincinnati road, freight and passengers now pass daily between Union and Cincinnati, on a line 22 miles further than it will be by Eaton, when the Eaton and Hamilton road is extended to Union. A road, however, is about to be made this summer from the Junction to Carlisle, called the Twin Creek railroad, which will shorten the distance from Union to Cincinnati 12 miles—making it only 10 miles further than by the Eaton route. This Twin Creek road is but 20 miles in length, and has stock enough raised to make it ready for the iron. A through line for freight and passengers, and uniformity of gauge, has been made by contract of the several companies, over the Twin Creek line. The Cincinnati, Union and Fort Wayne railroad by this route, as well as by the Eaton route, will be part of a Fort Wayne and Cincinnati line; and by the Greenville and Miami road, it will be a part of the direct Fort Wayne and Dayton line, and bring Fort Wayne in direct connection with the coal region of Ohio.

Coal for Locomotive Fuel.

The Baltimore and Ohio railroad have used bituminous coal (mostly from the Cumberland region) as a fuel for the locomotives employed upon their freight, coal and stock trains. They have adapted their engines for this fuel by extending the furnace grates, by lengthening the boiltubes, and, in some cases, by the use of the "rocking grate," the "variable exhaust pipe," and the "feed water heater." As the coal engine, in the form adapted to their road, possesses some distinctive characteristics, we will state them here, before giving the results obtained from the use of the coal fuel.

The weight of the recent class of stock engines building for this road is 30 tons, of 2,000 lbs—This is distributed upon six driving and four truck wheels, all the wheels being placed in front of the fire box; thereby limiting the length of the rectangle covered by the wheels to about 16 feet. The dimensions of cylinders are 20 inches diameter by 22 inch stroke. Diameter of drivers 50 inches. The furnace is made of 3-8 inch thick copper in the sides, and has a hammered iron crown of 5-16th inch thickness. The grate area is 18 square feet. The tubes are of wrought iron, lap welded, $2\frac{1}{4}$ inches diameter; 14 feet long; and have, in all, above 1,200 square feet of exterior surface.—The cylinder connections are always outside of the wheels, the axis of the cylinder lying in nearly a horizontal line.

The parts of the engine are simple and strong. The driving wheels are fitted always with slip ties of chilled cast iron. The spark arresters have an inside pipe, through which the sparks are projected against an inverted cone, formed of number 18 wire cloth, and having a mesh of about 3-32 inch opening.

The duration of the copper furnaces is from five to six years, or as long as the duration of an iron furnace burning wood. To renew the sides of the furnace, for a height of 24 to 28 inches from the grate, involves an outlay of about \$400. It is only around the bottoms of the furnaces where renewals are often required. The depth of coal carried is usually two feet next the door, and diminishing to nine inches or one foot next the tube

sheet. The duration of the grates, when kept clean from clinkers, and protected by a small amount of water in the ash pan beneath, is, on an average, one year. The general relative efficiency of coal to pine wood, is believed to be one ton of the former to two and a-half cords of the latter.

From trials made during the fall of the last year and in January of the present year, the following results were obtained; these being the averages of the results from different engines by different builders.

Engines of 19 to 20 inches cylinder, 22 in. stroke, 8 drivers of 43 in. diameter, running for 45 miles west of Cumberland, part of the distance up-grade of 116 feet per mile.

TRIALS MADE IN OCT., 1852.

Tons load—of 2000 lbs.—including tender hauled to foot of 116 feet grade.....	178.3
Tons load as above, hauled up 116 feet grade.....	114.5
Miles per hour to foot of 116 feet grade...	14.04
" " " up " " "	12.91
Pounds of coal used.....	5464.
Cubic feet of wood used—equal to 17 cord—.....	22.
Pounds of coal, per mile run.....	121.42
" " " to evaporate 1000 gallons of water.....	1434.

Same class of engines in November, 1852, and January 1853, running from Baltimore to Martinsburg, 99 miles, part of the distance being up a grade of 82 feet per mile.

Nov. 1852. Jan. '53.

Tons of 2000 lbs., including tender, to foot of 82 feet grade...	290.32	579.08
Tons, as above, hauled up 82 feet grade.....	245.46	504.19
Miles per hour to foot of 82 feet grade.....	10.88	11.10
Miles per hour up 82 feet grade.....	7.19	10.38
Pounds of coal used.....	5340.	5201.
Cubic feet of wood used.....	39.78	21.61
Pounds of coal, per mile run.....	53.94	52.54
" " " to evaporate 1000 gallons of water.....	957.	983.

It will be perceived by the statement of trials made in Nov. and in January, that twice the load was hauled in the latter trial, and with less fuel than was required for the trial in November. The engine was not worked up to its full power in the former trip, and this fact must account for the difference in the efficiency of the fuel used in the two trials. The wood used is only for starting the fire at the commencement of the trips.

The economy of the coal fuel would have been greater, but for a leakage in two of the engines tried. The highest results with the best engines show an evaporation of 1000 gallons of water by 807 lbs. of coal. The lowest result was an evaporation of one thousand gallons of water by 1551 pounds of coal.

Rutland and Burlington Railroad.

The annual meeting of the Rutland and Burlington railroad company was held at Bellows' Falls yesterday. The earnings of the year ending May 31, were \$495,397 54; expenditures \$228,858 38; net income over expenses \$266,539 12, a gain of 60 per cent over last year. The cost of the road, so far, has been \$5,477,466. The bonded debt is \$2,429,100; capital stock \$2,397,000. Floating debt \$485,466.

The following named gentlemen were chosen Directors for the ensuing year, namely:—Wm.

Raymond Lee, John Howe, C. J. Hendee, Harrison Fay, A. Wentworth, Jr., John Conant, and Benjamin T. Reed.

American Railroad Journal.

Saturday, June 18, 1853.

Railway Share List.

We give, in our present issue, a *Share List* of railroads in the United States, which presents what was never before attempted,—a complete view of their financial condition, as well as the current value of their shares. We shall add, in our next number, a list of the leading bonds before the market.

We solicit the particular attention of railroad companies to this List, for the purpose of correcting any errors in our tables, or supplying any omission that may exist in them. As only two or three States require returns to be made, we are compelled to depend upon the reports of companies for a knowledge of their condition. We shall esteem it a great favor if railroad companies will supply us with the necessary data for completing our tables, at their earliest convenience.

Stock and Money Market.

The stock market has presented no new feature. For the past week there has been some fluctuation among the fancies, but premium securities show no change, unless it is that they are a shade higher. There is a steady and fair demand for railroad bonds. Money is very abundant, but the season of the year does not form speculation.

The dividend on *Erie* is one of the leading topics in the street. Nothing is known of the matter outside the Direction. Our opinion is adverse to the propriety of declaring one. We take it for granted that none will be declared without the satisfactory evidence that one has been *earned*. It is useless to discuss the question till the action of the Directors is known. We do not wish to prejudge the matter. Our recent articles attacking the management of the road, have been followed by important changes and reforms. If these reforms shall be carried out, our objects will be secured. They cannot be effected in an instant.—We are willing to wait a reasonable time. We expect, however, to see the adoption of a correct line of policy at once. A proper plan for the *future* must be adopted, even should it be found difficult immediately to bring the working of the road to an ideal standard. Should a dividend be declared, we expect it will be accompanied by a balance sheet, showing the condition of the Company.—Such statements can be omitted no longer. The old apology, that a knowledge of the condition of the company's affairs would destroy public confidence, and in this way defeat the enterprise, are no longer allowable. The work is *completed*, and the sooner every thing is known about its cost and management the better. We expect much from Mr. McAlpine. We are confident he is making good use of his time. *He* can have no motive but a proper one. He is not implicated in the past history, nor is he a speculator in the stock and securities of the road. We are satisfied that other changes must take place, which will clear the Co. of all persons engaged in speculating in its stock and bonds. We think that nothing can be more improper than for persons, occupying high and responsible positions on a railroad, use such posi-

Railway Share List,

Compiled from the latest returns—corrected every Wednesday—on a par valuation of \$100.

NAME OF COMPANY.	Miles open.	Capital paid in.	Funded debt.	Tot. cost of road and equip't.	Gross Earnings in 1852.	Net Earnings in 1852.	Dividend, 1852.	Price of Shares.	
Atlantic and St. Lawrence... Maine	150	1,417,587	3,000,000	4,649,392	200,233	...	none	95	
Androscoggin and Kennebec...	55	809,878	905,300	1,994,429	181,006	...	none	30	
Kennebec and Portland...	72	876,741	800,000	2,180,000	183,338	...	none	40	
Port., Saco and Portsmouth...	51	1,355,500	123,884	1,459,384	208,669	6	100		
York and Cumberland...	20	227,981	291,200	In progress	15,694	...	none	40	
Boston, Concord and Montreal. N. H.	93	1,649,270	622,000	2,540,217	150,538	79,659	none	53 $\frac{1}{2}$	
Concord...	35	1,485,000	none.	1,485,000	305,805	141,836	10	108	
Cheshire...	54	2,078,625	720,900	3,002,094	287,768	55,266	5	...	
Northern...	82	3,016,634	...	...	828,782	163,075	5	58	
Manchester and Lawrence...	24	717,543	...	...	...	...	6 $\frac{1}{2}$	99	
Nashua and Lowell...	15	600,000	none.	651,214	132,545	51,513	8	108	
Portsmouth and Concord...	47	...	...	1,400,000	...	...	none	...	
Sullivan...	26	...	...	673,500	...	...	none	9	
Connecticut and Passumpsic. Vt.	61	1,097,600	550,000	1,745,516	...	...	none	46	
Rutland...	120	2,435,328	1,964,588	...	324,790	165,340	none	35	
Vermont Central...	117	8,500,000	3,500,000	12,000,000	...	...	...	18	
Vermont and Canada...	47	1,500,000	...	1,500,000	Leased to the Vt. C.	...	101 $\frac{1}{2}$		
Western Vermont...	51	392,000	700,000	...	Recently opened.	none	...		
Vermont Valley...	24	...	...	...	...	...	none	...	
Boston and Lowell...	Mass.	1,830,000	...	1,995,249	388,108	130,881	7 $\frac{1}{2}$	100	
Boston and Maine...	"	83,476,974	150,000	4,092,927	659,001	338,215	7	109	
Boston and Providence...	"	53,160,390	390,000	3,548,214	429,484	212,625	6	88 $\frac{1}{2}$	
Boston and Worcester...	"	69	4,500,000	425,000	4,845,967	758,819	331,296	7	104 $\frac{1}{2}$
Cape Cod branch...	"	28	421,295	171,800	633,906	60,743	30,056	2 $\frac{1}{2}$	40
Connecticut River...	"	52	1,591,100	193,500	1,801,946	229,004	72,028	5	57 $\frac{1}{2}$
Eastern...	"	75	2,850,000	500,000	3,120,391	488,793	241,017	7 $\frac{1}{2}$	95
Fall River...	"	42	1,050,000	none.	1,050,000	229,445	99,589	8	107
Fitchburg...	"	66	3,540,000	100,000	3,633,673	574,574	232,787	6	103
New Bedford and Taunton...	"	20	500,000	none.	520,475	164,230	43,950	7 $\frac{1}{2}$	117
Norfolk County...	"	26	547,015	819,743	1,245,927	67,251	23,415	none	67
Old Colony...	"	45	1,964,070	282,300	2,298,534	322,213	101,510	none	86 $\frac{1}{2}$
Taunton Branch...	"	12	250,000	none.	307,136	137,406	24,399	8	...
Vermont and Massachusetts...	"	77	2,140,536	1,001,500	3,203,333	218,679	18,648	none	17 $\frac{1}{2}$
Worcester and Nashua...	"	45	1,134,000	171,210	1,321,945	162,109	66,900	4 $\frac{1}{2}$	60
Western...	R. I.	155	5,150,000	5,319,520	9,953,759	1,839,873	682,195	6 $\frac{1}{2}$	102 $\frac{1}{2}$
Stonington...	"	50	...	...	...	...	...	56	
Providence and Worcester...	"	40	1,457,500	300,000	1,731,498	253,690	139,514	6	...
Canal...	Conn.	45	...	...	...	...	10	...	
Hartford and New Haven...	"	62	8,000,000	472,000	...	600,408	332,223	none	124
Housatonic...	"	110	...	...	2,500,000	329,041	168,902	none	...
Hartford, Prov. and Fishkill...	"	50	...	...	In progress	...	...	...
New London, Wil. and Palmer...	"	66	558,861	800,000	1,511,111	114,410	...	...
New York and New Haven...	"	61	2,992,450	1,641,000	4,825,937	814,714	443,993	7	109
Naugatuck...	"	62	926,000	440,000	...	...	...	...
New London and New Haven...	"	55	750,500	650,000	1,386,610	Recently opened.	none	45	
Norwich and Worcester...	"	54	2,121,110	701,600	2,596,488	267,561	116,965	4 $\frac{1}{2}$	55
Albany and Schenectady...	N. Y.	17	1,000,000	685,301	1,774,584	296,112	164,448	8	139
Buffalo and New York City...	"	91	900,000	1,550,000	2,550,500	Recently opened.	none	85	
Buffalo, Corning and N. York...	"	132	...	...	In progress	...	...	none	65
Buffalo and Rochester...	"	76	1,825,000	184,903	2,415,014	619,976	415,323	10	182
Buffalo and State Line...	"	69	879,636	872,000	1,921,270	Recently opened.	...	128	
Canandaigua and Niagara F...	"	50	...	...	In progress	...	...	...
Canandaigua and Elmira...	"	47	425,509	582,400	987,627	76,760	39,360	none	68
Cayuga and Susquehanna...	"	35	687,000	400,000	1,070,786	74,241	23,496	none	...
Erie, (New York and Erie)...	"	464	9,612,995	24,008,865	31,301,806	3,537,766	1,691,623	7	87
Hudson River...	"	144	3,740,515	7,046,395	10,527,654	1,063,659	338,783	none	72 $\frac{1}{2}$
Harlem...	"	130	4,725,250	977,463	6,102,935	681,445	324,494	5	65 $\frac{1}{2}$
Long Island...	"	95	1,875,148	516,246	2,446,391	205,068	44,070	none	36
Ogdensburg (Northern)...	"	118	1,578,811	2,780,760	4,933,029	435,845	176,123	none	43
Oswego and Syracuse...	"	35	350,000	201,500	607,803	90,616	43,609	4	70
Rochester and Syracuse...	"	184	5,132,990	700,123	6,016,778	988,366	549,824	8	156
Rutland and Washington...	"	60	850,000	400,000	1,250,000	Recently opened.	...	...
Saratoga and Washington...	"	41	899,800	940,000	1,832,945	173,545	135,017	none	30
Syracuse and Utica...	"	53	2,400,000	126,000	2,661,477	616,918	376,025	10	182
Troy and Rutland...	"	32	237,690	100,000	329,577	Recently opened.	...	33	
Troy and Boston...	"	39	430,936	700,000	1,043,357	Recently opened.	none	...	
Utica and Schenectady...	"	78	4,124,000	none.	4,098,273	1,029,774	724,770	10	195
Watertown and Rome...	"	96	1,011,940	650,000	1,693,711	225,152	116,706	8	109
Camden and Amboy...	N. J.	65	1,500,000	...	4,327,498	1,388,385	478,413	10	149
Morris and Essex...	"	45	1,022,420	128,000	1,220,325	140,154	80,351	4	...
New Jersey...	"	31	2,197,840	476,000	3,245,720	603,942	316,259	10	148
New Jersey Central...	"	63	986,106	1,500,000	2,379,880	260,899	124,740	3 $\frac{1}{2}$	...
Cumberland Valley...	Penn.	56	1,184,500	18,000	1,265,143	118,617	76,890	5	...
Erie and North East...	"	20	600,000	...	750,000	Recently opened.	...	125	
Harrisburgh and Lancaster...	"	36	788,950	688,051	1,609,494	200,249	106,932	8	
Philadelphia and Reading...	"	95	6,656,832	10,427,800	17,141,987	2,480,626	1,251,987	7	98 $\frac{1}{2}$

Railway Share List,

Compiled from the latest returns—corrected every Wednesday—on a par valuation of \$100.

NAME OF COMPANY.	Miles open.	Capital paid in.	Funded debt.	Tot. cost of road and equipm't.	Gross Earnings in 1852.	Net earnings in 1852.	Dividend, 1852.	Price of shares.
Philad., Wilmington and Balt. Penn.	98	8,850,000	2,408,276	6,813,839	667,785	383,501	5	100
Pennsylvania Central.....	250	9,768,153	5,000,000	15,600,000	1,943,827	617,825	100	
Philadelphia and Trenton.....	30	.....	.....	.....	.....	.....	.....
Pennsylvania Coal Co.....	47	.....	.....	.....	.....	.....	.....
Baltimore and Ohio.....	Md. 381	9,188,300	9,827,123	19,542,307	1,325,563	615,884	7	72
Washington branch.....	38	1,650,000	.....	1,650,000	348,622	216,237	8	
Baltimore and Susquehanna.....	57	.....	.....	.....	418,673	152,536	42	
Alexandria and Orange.....	Va. 65	.....	.....	In prog.	.....	.....	.....
Manassas Gap.....	27	.....	.....	In prog.	.....	.....	.....
Petersburgh.....	64	.....	.....	.....	.....	.....	.....
Richmond and Danville.....	73	.....	.....	In prog.	.....	.....	.....
Richmond and Petersburgh.....	22	.....	.....	.....	.....	.....	.....
Rich., Fred and Potomac.....	76	.....	.....	.....	.....	.....	.....
South Side.....	62	1,328,722	800,000	In prog.	.....	.....	.....
Virginia Central.....	107	1,400,100	446,036	In prog.	176,485	74,902	none	
Virginia and Tennessee.....	60	8,000,000	1,500,000	In prog.	.....	.....	.....
Winchester and Potomac.....	32	180,000	120,000	416,532	89,776	.....	12	
Wilmington and Raleigh.....	N. C. 161	1,338,878	1,134,698	2,965,574	510,038	153,898	6	
Charlotte and South Carolina.....	S. C. 110	.....	.....	.....	.....	.....	.....
Greenville and Columbia.....	140	1,004,231	300,000	In prog.	.....	.....	.....
South Carolina.....	242	3,858,840	3,000,000	7,002,336	1,000,717	609,711	7	125
Georgia Central.....	191	3,100,000	306,187	3,378,132	945,508	508,625	8	102
Georgia.....	211	4,000,000	1,214	.....	934,424	456,468	7½	
Macon and Western.....	101	1,214,283	168,000	1,596,283	296,584	153,697	9	109
Muscogee.....	71	.....	.....	In prog.	.....	.....	.....
Wilmington and Manchester.....	.....	.....	.....	“	.....	.....	.....
Southwestern.....	50	586,887	150,000	743,525	129,895	71,535	8	
Alabama and Tennessee River.....	Ala. 55	.....	.....	In prog.	.....	.....	.....
Memphis and Charleston.....	93	776,259	400,000	In prog.	.....	.....	.....
Mobile and Ohio.....	33	879,868	.....	In prog.	.....	.....	.....
Montgomery and West Point.....	88	688,611	.....	1,330,960	178,542	76,079	8	
Southern.....	60	.....	.....	.....	.....	.....	.....
East Tennessee and Georgia.....	Tenn. 80	835,000	541,000	In prog.	.....	.....	.....
Nashville and Chattanooga.....	125	2,098,814	850,000	In prog.	.....	.....	.....
Covington and Lexington.....	Ky. 1,430,000	900,000	In prog.	.....	.....	.....	.....
Frankfort and Lexington.....	28	.....	.....	.....	87,421	44,250	.....
Louisville and Frankfort.....	65	.....	.....	.....	.....	.....	.....
Maysville and Lexington.....	.....	.....	.....	In prog.	.....	.....	.....
Cleveland and Pittsburgh.....	Ohio. 100	1,239,454	1,371,000	2,963,756	194,429	123,306	6	102
Cleveland, Painesv. and Ash.....	71	.....	.....	In prog.	.....	.....	.....
Cleveland and Columbus.....	135	3,027,000	408,200	3,655,000	777,793	483,483	12	132
Columbus, Urbanna and Piqua.....	.....	.....	.....	In prog.	.....	.....	.....
Columbus and Lake Erie.....	61	.....	.....	.....	.....	.....	.....
Cincinnati, Ham. and Dayton.....	60	1,694,000	906,000	2,600,000	321,793	200,967	.....	115
Cincinnati and Marietta.....	.....	.....	.....	In prog.	.....	.....	.....
Dayton and Western.....	40	310,000	550,000	925,000	Recently opened.	.....	80	
Dayton and Michigan.....	20	.....	.....	In prog.	.....	.....	.....
Eaton and Hamilton.....	36	.....	.....	.....	.....	.....	.....
Greenville and Miami.....	31	.....	.....	.....	.....	.....	.....
Hillsboro.....	37	.....	.....	.....	.....	.....	.....
Little Miami.....	84	2,370,784	.....	In prog.	2,634,157	526,746	314,670	10 120
Mansfield and Sandusky.....	.....	900,000	1,000,000	1,855,000	.....	.....	.....
Mad River.....	167	1,860,500	.....	.....	565,751	.....	.....
Ohio Central.....	57	.....	.....	In prog.	“	.....	.....
Ohio and Mississippi.....	.....	.....	.....	.....	.....	.....	.....
Ohio and Pennsylvania.....	187	1,750,700	2,450,000	.....	.....	.....	.....
Ohio and Indiana.....	.....	.....	.....	In prog.	“	.....	.....
Scioto and Hocking Valley.....	.....	.....	.....	.....	.....	.....	.....
Toledo, Norwalk and Cleavel'd.....	87	552,000	800,000	1,317,140	Recently opened.	.....	145	
Xenia and Columbus.....	54	1,092,137	119,500	1,257,714	237,506	135,363	15	
Evansville and Illinois.....	Ind. 31	.....	.....	In prog.	“	.....	.....
Indiana Central.....	.....	.....	.....	.....	.....	.....	.....
Indiana Northern.....	131	.....	.....	“	Recently opened.	.....	.....
Indianapolis and Bellefontaine.....	83	.....	.....	“	.....	.....	.....
Lawrenceburg and Ind.....	.....	.....	.....	In prog.	.....	.....	75	
Lafayette and Indianapolis.....	62	.....	.....	.....	Recently opened.	.....	.....
Madison and Indianapolis.....	88	1,650,000	750,000	2,400,000	516,414	268,075	10	102
Peru and Indianapolis.....	40	.....	.....	In prog.	.....	.....	.....
Terre Haute and Indianapolis.....	72	632,387	663,100	1,353,019	106,598	71,446	4	108
Rock Island and Chicago.....	.....	.....	.....	.....	.....	.....	.....
Chicago and Mississippi.....	.....	.....	.....	.....	.....	.....	.....
Galena and Chicago.....	Ill. 92	1,982,361	500,000	In prog.	472,109	.....	130	
Illinois Central.....	.....	.....	.....	.....	.....	.....	.....
Michigan Southern.....	Mich. 315	2,499,410	2,629,000	6,430,246	292,187	298,046	145	
Michigan Central.....	282	.....	.....	.....	.....	.....	117	
Pacific.....	Miss. 282	.....	.....	.....	.....	.....	.....

tions for the purposes of speculation. There can be no doubt that the interests of the Erie road have suffered vastly from this cause. We believe that a spirit of reform is awakened among the stockholders of the Erie road, that will not be quieted till its whole management is thoroughly purged.

The following statement shows the aggregate amount of tolls collected on all the Canals of this State up to May 31, for several years, and the amount collected during the fourth week in May in each year:

	Fourth week in May.	Total to May 31.
1846	\$116,016	\$598,760
1847	196,175	709,880
1848	188,305	621,323
1849	136,672	615,110
1850	121,393	596,328
1851	127,399	773,330
1852	107,222	545,199
1853	129,652	598,775
Increase in 1852 to May 22.	.....	\$26,146
Increase for 4th week in May, 1853.	.....	22,480
Total increase.....	.....	\$48,576
The subjoined table shows on what description of freight these tolls have been collected, comparing this year with last:	1852. 1853. Dec'se Incr'e	
On up freight, merchandise.....	\$176,363	\$205,305
On down fr't from other States.....	697,511	219,279
On downfr't from this State.....	171,275	159,192
Total.....	\$645,199	\$598,775
Decrease.....	.....	\$2,084
Increase.....	.....	\$48,576

The earnings of the Greenville and Miami railroad for the first five months of the year, show a steady gain, and are beyond the estimates. The figures are—

January.....	\$8,800	25	April.....	\$9,271	54
February.....	8,970	25	May.....	11,257	39
March.....	9,578	94	Total.....	47,964	87

These earnings have been made with an incomplete equipage. June promises to show a still larger advance.

The receipts of the Cleveland and Pittsburgh railroad for May, 1853, are as follows:

For passengers.....	.....	\$18,731	32
For freight, mails, etc.....	.....	16,682	62
Total.....	.....	\$35,364	44
Receipts for May, 1852.....	.....	25,332	30

Increase..... \$10,032 14

The business of the Ohio and Pennsylvania railroad has been as annexed:

Receipts in May, 1853.....	.....	\$47,366	00
Receipts in May, 1852.....	.....	20,893	65

Increase..... \$26,472 35

First 5 months in 1853..... \$186,934 24

First 5 months in 1852..... 76,984 37

Increase..... \$109,949 87

This is a gratifying exhibit, for the first month in the beginning of the through trains. The thro' trains only began to run on the 16th of May. The

next two or three months will show the importance of this great route.

The earnings of the Macon and Western railroad company for May were:

Passengers	.....	\$6,812 27
Mails	.....	1,080 04
Freights	.....	8,717 80

Corresponding month last year	.....	\$16,609 61
Decrease	.....	\$1,648 35

The earnings of the Greenville and Miami railroad for the first five months of the year show a steady gain, and are beyond the estimates. The figures are:

January	.....	\$8,800 25
February	.....	8,970 25
March	.....	9,578 94
April	.....	9,271 54
May	.....	11,257 39

\$47,964 37

These earnings have been made with an incompetent equipage. June promises to show a still larger advance.

The receipts of the Pennsylvania railroad for month of May were as follows:

From passengers	.....	\$116,982 22
From freight	.....	76,546 12

Total for the month	.....	\$193,478 34
Corresponding month last year	.....	161,583 92

Increase	.....	\$31,894 42
Total receipts from Jan. to May, inclusive, 1853	.....	\$1,292,588 53
Corresponding period last year	.....	857,990 20

Increase this year..... \$434,563 33

The following statement will show the earnings of the Cincinnati, Hamilton and Dayton railway for May:

Earnings.	1852.	1853.
From passengers	.....	\$15,868 61
From freight	.....	7,188 62
From mails and express	.....	180 92

Total	.....	\$22,717 15
		\$35,061 10

22,701 15

Increase, 54 per cent..... \$12,359 95

The receipts of the Hudson River railroad Co. for May were	.....	\$98,704
May, 1852	.....	61,088

Increase 53½ per cent..... \$32,666

The earnings of the Rutland and Burlington railroad company for the month of April were	.....	\$40,376 08
In same month last year	.....	20,385 33

Gain this year (nearly 100 per cent) \$19,991 65

The receipts of the Erie railroad for May are not up to those of April, and show a small gain over those of May, 1852:

They were	.....	\$389,412 33
May, 1852	.....	369,285 56

Increase..... \$20,126 77

The aggregate for the past 5 months	.....	\$1,796,707
1852	.....	1,814,588

Increase 35 per cent..... \$482,119

The earnings of the Chicago and Rock Island railroad for May were:

For passengers	\$27,899 64
For freight and mails	8,715 28

Total	\$31,414 92
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The revenue of the Baltimore and Ohio railroad for the month of May, has been as follows:

Main Stem.	Washington Branch.	Totals.
Passengers	\$26,625 33
Freight	153,120 00
Total	\$81,147 88

Total..... \$204,950 01

\$32,318 66

287,267 88

The receipts of the corresponding month (May) of last year, were \$141,734 13 from the Main Stem, and \$38,140 25 from the Washington Branch, making a total of \$174,974 38; thus showing an aggregate increase of \$62,894 29, of which over \$26,000 was from passengers, and \$37,000 from freight on the main stem.

The receipts of the Milwaukee and Mississippi railroad for the first four days of this month, were \$3,000. This was on 70 miles of road.

Dayton and Western Railroad.

We gave last week the recent exhibit published by this company. We learn that the road, is now in good running order, the ballasting of the track having been nearly completed, and that the daily receipts from ordinary business equal about \$200 per day, and are rapidly increasing. From the Indiana state line, the Central road is making rapid progress, and will be completed in September next. A greater part of the business of this road will be thrown upon the Dayton and Western.

The route occupied by both is not only identified with the great route of travel which has been followed since the first settlement in the west, but the one upon which the most important interior towns of both states have grown up, making it the convenient as well as the necessary route for every business man. The city of Dayton, already commands a large portion of the trade of the country traversed by the Dayton and Western road, and must either remain the market, or the point in transitu, of the products of the country lying west to the markets of the east. We see no reason why the stock and bonds of this road will not become favorite securities for investment.

Rutland Railroad.

Wm. Raymond Lee, Superintendent of the Boston and Providence railroad, has been recently chosen President of the Rutland railroad.

Alexandria, Loudoun and Hampshire Railroad.

A meeting of the stockholders of this company was recently held at Alexandria. The following notice of their proceedings we copy from the Alexandria Gazette:

"The stockholders of the Alexandria, Loudoun and Hampshire railroad company held their first annual meeting yesterday. The usual business attending an organization was transacted, and an interesting discussion of the policy and prospects of the Co. took place, upon a resolution in relation to the surveys for a route, which was finally laid upon the table.

Lewis McKenzie was unanimously elected President of the Company, and James McIlhenny, of Loudoun, and George H. Smoot, of Alexandria, Directors on the part of the Stockholders.

Messrs. Robert H. Miller, of Alexandria, Noble S. Braden of Loudoun, and John Bruce, of Winchester, were appointed the committee to examine into the affairs and proceedings of the Company, and report thereon at the general meeting, to be held in this place on the third Tuesday in October next.

The by-laws of the Manassas Gap railroad company were adopted as far as applicable, and Messrs. Cassius F. Lee, David Funsten, and A. Sidney Tebbs

were appointed a committee to report to the next meeting, such changes therein as they deem expedient.

The annual meetings of the Co. were ordered to be held in Alexandria, on the third Thursday in October, in each year."

Great Western Railway.

We have the report of the Directors of this Co., submitted at the annual meeting of the stockholders, held at Hamilton, on the 6th inst., which presents the following statement of the affairs of the Company:

The amount expended upon the road up to 30th April, 1852, was..... £383,089 8 5 Amount expended from April 30th, '52, to April 30th, '53..... £939,718 14 5

Total expenditure up to April 30, 1853..... £1,322,758 2 10

It will be seen that a large amount of work has been performed since the last annual meeting, and the progress already made is such as to insure the greatest advancement of the work during the present season. All the important structures are in rapid progress of completion, the grading is in an advanced state, and arrangements are made for a vigorous prosecution of the work along the whole line. Most of the rails, of the best description, and purchased before the recent advance in iron, are already delivered, and the balance are on the way from England, via Quebec.

The Directors express a confident belief that by adopting the most energetic measures to press on the work, they will be able to open the line from the Detroit river to Niagara by the 1st of January next. This delay beyond the time anticipated in the last report, will result from the excess of the present estimates of work and cost over those submitted at the last annual meeting.

The Directors state that Mr. Stuart, who first surveyed the road and estimated its construction, was succeeded by Mr. R. G. Benedict, in September, 1851, before the financial position of the company had allowed them to commence the undertaking on a large scale. Mr. Stuart's estimates amounted to £1,326,000. After receiving instructions to make the structures of the line available for a double track, and after making detailed measurements of the line, Mr. Benedict submitted a revised estimate, which exceeded the former by £286,000 currency. This led to a careful investigation, on the part of the Directors, which resulted in the resignation of Mr. Benedict, and Mr. J. T. Clark, who had been, for some time, appointed as Commissioner, was appointed Chief Engineer, November 9th, 1852. Mr. Clark is an Engineer of high standing in the United States, and has had extensive experience in the construction of public works there; and these facts, combined with the knowledge he had acquired of the Great Western line, rendered him the most eligible person to fill the office to which he has been appointed.

Mr. Clark's present estimates have exceeded the amended estimates of Mr. Benedict by £336,295 currency; making a gross excess, over the first estimates, of £622,295 currency. The Directors regret exceedingly that they have been the medium of deceiving the stockholders by transmitting such loose and unreliable statements of their prospects, but believe the extent of the deception may be measured by the ascertained extra cost and loss of time, and that the stockholders may rely upon the statements and esti-

uates of the present able and efficient Chief Engineer.

The Directors cannot avoid expressing their conviction that the road, when completed, will compare satisfactorily with any works on this side of the Atlantic, and that the whole cost of the line, when completed and furnished with the equipments for the conduct of the traffic, will not much exceed £7,500 sterling, per mile; a rate that will sound startling to those acquainted with the cost of European railways.

Twenty locomotives are contracted for; also 25 eight wheel passenger cars, 20 emigrant cars, 350 freight and gravel cars, and a fair proportion of mail, express, baggage, repair and hand cars, all of which will be delivered in ample time. Permanent and substantial workshops and stations have been contracted for at Hamilton and London, these points being the centres of important business and the proper points for the workshops of the line. At other places, inexpensive buildings will be erected, which can be increased or perfected as the business becomes developed.

The arrangements referred to, in the report of 1852, in regard to the issue of shares in England, have been fully completed, and in the early part of the present year a further amount of shares and bonds was offered to the stockholders, and readily subscribed for, making the present number of shares in England, and the amount of convertible bonds—the issue of which is authorised by a distinct legislative enactment—equal to about £1,200,000 currency; the various calls upon which have been paid with the utmost regularity.

The present session of the provincial legislature have granted an act authorising the increase of the capital from £1,500,000 to £2,000,000 currency.

After the incorporation of the Guelph and Sarnia line into the Grand Trunk prospectus, a memorandum of an arrangement was drawn, which will be recommended to the Boards of the two companies as the basis of a friendly agreement, by which neither company will suffer from interference or competition.

As the proceedings of the Grand Trunk company rendered it extremely important to secure the "control of the Hamilton and Toronto railway, it has been arranged that this company take a lease of that line, at a rent of six per cent on its guaranteed cost, with an equal participation in all dividends paid by the Great Western company." The directors strongly recommend this lease to the adoption of the stockholders, as a means of cementing the Great Western interests and of keeping the whole in a profitable and independent position.

After the sanction of the Guelph and Sarnia line, the directors became convinced of the necessity of extending their branch from London to Sarnia, this being part of the original scheme and forming from its position and route a valuable part of the company's system. An act has accordingly been procured, at the last session, authorising the construction of this branch by an independent company, with power to amalgamate with the Great Western, so that the line may be opened under this or under the original powers of the Great Western as may be found desirable. The directors believe that satisfactory arrangements can be completed for the construction of the Sarnia Line under the original charter, and recommend that

authority be given them to commence its construction.

The following capital account is appended.

GREAT WESTERN RAILWAY CAPITAL ACCOUNT.

Expen- ditures last re- port last port to	Re- April 30, port. 1853. Total.	Grand total.
DR.		
Eastern Division—		
42½ miles, Niag- ara to Hamilton, Grading, mason- ry, bridging and superstructure,— exclusive of iron.	6,337 109,996 116,333	
Central Division, 27-9 miles, Ham- ilton to London. Items as for east- ern division....	188,883 221,216 410,100	
Western Division, 110.3 miles, Lon- don to Windsor. Items as for east- ern division....	10,152 160,298 170,450	
Galt branch, 12.02 miles. Items as for Eastern divi- sion.....	11,245 21,918 33,164 730,047	
Cost of iron.....	59,532 212,891	272,223
Right of way.....	40,770 58,166	98,936
Engineering for the whole line.....	23,087 22,408	45,495
Locomotives, cars and machinery.....		46,244
Interest on shares and bonds.....		69,844
Expenses at London agency.....		33,935
Other charges.....		26,082
Total expenditure till April 30, 1853....	1,322,758	
Balance.....	451,155	
		£1,773,913

CONTRA: CR.

By amount paid on 49,155 shares.	£842,913	5	10
" " " Bonds issued in 1852, and convertible into shares on or before 1856.....	443,500	0	0
By amount Bonds issued in 1853, non-convertible, redeemable in 1873.....	212,500	0	0
By Loan from the Provincial Gov- ernment.....	244,444	9	0
By Premiums on sale of Provincial Bonds.....	30,555	11	0
	£1,773,913	5	10
By Balance.....	£451,155	0	0
By amount receivable on Stock..	148,477	0	0
	£599,632	0	0

Statistics of New Hampshire.

The following statistics of New Hampshire will be found interesting. They are from the recent message of Gov. Martin:

The aggregate banking capital in the State is \$3,226,000, inclusive of Savings Institutions, the capital of which is \$2,182,218.

There are 6244 miles of railroad in the State, in running order, which have cost \$18,346,086 64; the last annual receipts have been \$1,768,455 98, and the net revenue averaging nearly 4½ per cent on the whole investment.

The educational institutions in the State are represented to be in a flourishing condition. The number of persons engaged in educational pursuits is stated to be 92,833; the amount of money applied for the purposes of education \$271,747; and the number of educational institutions of every grade 2,894.

The State debt has increased during the last year from \$66,195 08 to nearly \$74,000. The

quadrennial session of last fall has been the principal cause of this extra expense.

The lands improved and under tillage number 2,251,488 acres; value of farms \$55,245,997; farm implements and machinery \$2,314,125; live stock \$8,871,901; orchard products \$248,563; domestic manufactures \$393,445. We raise an average crop of 185,658 bushels of wheat; 183,117 do. of rye; 1,573,670 do. of Indian corn; 978,381 do. of oats; 70,856 do. of peas and beans; 70,256 do. of barley; 65,265 of buckwheat; 4,304,919 do. of potatoes; and we produce 1,108,476 lbs of wool; 6,977,056 lbs of butter; 3,196,563 lbs of cheese; 1,294,868 lbs of maple sugar.

There are in the same State 44 cotton establishments in operation, covering an investment of \$10,950,560; manufacturing 113,106,247 yards of cloth, using 98,026 bales of cotton; consuming 7,879 tons of coal; involving a value of raw material of \$4,839,429; employing 2,911 male, and 9,211 female operatives; disbursing to the former \$75,718, and to the latter \$124,131 per month—making an average to the males of \$25 45, and to the females \$13 47 per month; and producing an aggregate value of products of \$8,830,619. Woolen establishments, 61; investments \$2,437,700; yards of cloth manufactured, 9,712,840; pounds of wool used, 3,604,103; tons of coal, 3,600; value of raw material \$1,267,298; number of males employed, 926; females, 1,201; entire wages pr month, males \$21,177; females, \$17,451; average wages per month for the former, \$22 84; the latter, \$14 51; value of the entire products, \$2,127,745.

Wabash and Erie Canal.

About the first of the next month the Wabash and Erie Canal will be called completed. It is contemplated that the water will be let in at that time, although the canal will not be in running order for several weeks thereafter. Indeed, it will require several weeks to let the water in properly, and with the proper precautions. This stupendous work is by far the greatest and most costly public improvement in the State. The first act of Congress granting lands to this canal was passed in 1827, and additional grants were made in 1841 and 1845. The work, however, was commenced in 1832, and completed to Lafayette in 1842; to Covington in 1843; to Coal Creek in 1847; to Terre Haute in 1849; to Point Commerce in 1851; to Evansville in 1853. Thus it has been over twenty years since this great canal was commenced. The length of the Wabash and Erie canal, in Indiana, is 375 miles, and in Ohio, from the State line to Toledo, on Maumee Bay, 84 miles; making, in all, 459 miles.

The value of such a tremendous artificial channel of trade to Evansville, its Ohio terminus, cannot be estimated at this time. Our people may talk about air line railroads, &c., most valuable and desireable improvements as they are, but this canal will be worth more to Evansville than all else combined. Bringing down the tolls, as it is intended, to the lowest notch, heavy freight will be carried on this canal at rates with which railroads cannot compete. A large portion of the year it will supersede the Wabash river as a channel for bringing to the Ohio river the produce of the rich Wabash valley, and conveying back merchandise, &c.

Yet, immense as must be the trade poured into the lap of Evansville by this great improvement, scarcely an effort has been made to accommodate this trade, by the erection of warehouses, &c.—The business, however, will soon bring the means for its accommodation, yet a considerable portion of trade must be lost to this city during the summer for the want of proper warehouses. We hope in the fall, when we shall sum up the buildings erected during the season, to have the pleasure of placing in the list, several large and substantial ware houses and commission stores on the canal.

Be this as it may, we hail with joy the final completion of the canal. Now for a celebration!—There is no work in the whole west comparable to this, and certainly in view of its speedy completion

we should be discussing, if not preparing a celebration worthy of the enterprise, the completion of which it is intended to commemorate. What say our friends at Terre Haute and Lafayette?—*Evansville Journal.*

Morris and Essex Railroad.

The annual report of the Board of Directors of the Morris and Essex railroad, submitted to a meeting of the stockholders, held at Dover on the 8th inst., states the receipts for the year to have been \$149,941 48, of which there were from passengers \$91,267 02; freights \$54,892 69; mails \$3,471 77. The expenses amounted to \$71,689 79, leaving a surplus of \$79,251 39. Gross receipts for the year ending May 31, 1852, were \$129,284 29, and the expenses \$74,377 05; increase in receipts over the previous year of \$20,707 19, and a decrease of expenses of \$2,678 26. The surplus last year over expenses \$10,282 35. Two semi-annual cash dividends amounting to \$39,701 20, were declared, and a stock dividend of ten per cent. has been placed to the credit of the stockholders, amounting to \$92,280; of this \$79,363 17 was placed to the debt of redemption purchase, closing that account. The balance of \$12,916 83, to profit and loss.

Attica and Alleghany Railroad.

The object of this road is to open a communication between the coal fields of north-western Pennsylvania and western New York, as well as to supply railroad accommodations to one of the best agricultural portions of this State. The road commences at *Attica*, and runs to the Pennsylvania State line, a distance of about 74 miles, where a junction will be formed with the Alleghany Valley road, of Pennsylvania, now in progress. From Attica a direct railroad communication exists with *Rochester*, so that with the roads now in operation and progress, a direct railway connection will be soon opened by that city and *Pittsburg*. The entire line of the Attica and Alleghany road is in progress, to be completed by the first day October, 1854.

Another project connected with the above, and which must add greatly to its value and importance, is the proposed road from Buffalo to the Pennsylvania coal fields, and which will, probably, connect at a common point in the Attica line, about 30 miles from the Attica and Buffalo; both branches using one trunk line for the remainder of the distance. The project of a railroad to the coal fields has, for some time past, attracted much attention in Buffalo, and the great necessity for such a work must secure its early construction. Buffalo must have an uninterrupted communication with the coal beds at all seasons of the year. At the present all her supplies of fuel have to be collected during the season of navigation. An abundant supply of coal is an indispensable element to her progress. The Alleghany Valley road too is much needed, to supply western New York, with every variety of lumber, which is found in the greatest abundance in northern Pennsylvania, which is now the source of supply of this article to a very great extent of country. The above road is not only required to meet the pressing wants of an already existing business, but it runs through a section of country that can easily contribute a larger portion of the cost of construction.

In this connection we give a copy of a letter from the President of the Buffalo and Alleghany

Valley road, which, as before stated, will be likely to become a part of the above road.

Buffalo and Alleghany Valley Railroad.

Since the scheme for opening a railroad communication between the city and the coal fields of Pennsylvania, was first projected, I have regarded it with earnest favor; so much so, as to be willing while no other means of its accomplishment were presented, that the city credit should be used for that purpose. And although I should have preferred that the city subscribe directly for the stock, as in the case of the Brantford road, I even concluded to support the application of the Buffalo and Pittsburg road for the loan of the bonds of the city, when, about ten days ago I learned, for the first time, that another organization was contemplated, intended to accomplish the same purpose without any such auxiliary aid. Application was then made to me to interest myself in that enterprise; I said "I must know more about the route," "didn't wish to hazard the loss of both roads," "must be satisfied that the new route was feasible, and would be run"—and that a favorable connection could be made with the Attica and Alleghany Valley railroad. Since then, all the time at my command has been devoted to a thorough investigation of this subject and with the following results:

The Attica and Alleghany Valley railroad company, organized last fall, have now under contract their entire road, from Attica southwesterly about 25 miles to Arcade, and thence south about 48 miles to the State line of Pennsylvania. A large force is at work upon this road. It will be completed to Arcade this Fall, and is to be finished to the State Line by Sept., 1854.

Arcade, or a point between there and Yorkshire two and a half miles west, is directly in line of the survey made by Mr. Wallace, for a road from Buffalo to the coal fields, and which he pronounces the most feasible route to that region.

A company has been organized under the title of the "Buffalo and Alleghany Valley Railroad Company," over \$1,000 per mile has been subscribed, ten per cent paid in in cash, a charter secured, a board of directors, consisting of Hon. C. O. Shepard, and C. J. Parker, of Arcade; Lewis Marsh, of Yorkshire, B. H. Colgrove, of Sardinia, P. D. Riley, of Holland, Wm. C. Russell, of South Wales, Robert Person, James M. Paine, Jabez Allen, and Aaron Riley, of Aurora, and Silas Hemenway, Wm. Wallace, and A. L. Baker, of Buffalo, elected and each member of that board expresses the determination that the road shall be speedily built.

A favorable contract has been made for the construction of the Buffalo and Alleghany Valley railroad to be graded to Aurora, by Nov. 1853, and completed to the Junction by July, 1854.

An arrangement has been made with the Attica and Alleghany Valley railroad company, by which the Buffalo and Alleghany Valley railroad Company have secured, among other things,

The right to connect with that road near Cattaraugus Creek, and to pass over that portion of their road south of the Junction, without any hindrance, and on the time table of the latter road, upon just terms.

2. The right, at the option of the Buffalo and Alleghany Valley railroad Company, to stock that road against their, or consolidate the two roads on just terms by arbitration.

3. The right to build a second track, if it shall be found necessary, over and upon their right of way, from the Junction to the State line, and when that shall be done, to use both tracks as a double track road.

Now, fellow citizens, the facts above stated have induced me to believe that all the desirable ends to be secured by lending your credit to the Buffalo and Pittsburg company, are within your reach without assuming the burden of a \$400,000 loan.

The substitute road is but 30 miles long. It passes through the valley of the Cazenovia Creek, over the most productive region of Erie County. It re-opens a communication between your stores

and markets and the valleys of the Cattaraugus and Upper Tonawanda, which has been suspended by the Erie railroad.

It gives you the same benefits, in respect to cheapening fuel, which are promised by the other.

And last, though not least in importance, it renders it entirely unnecessary to increase your already large and constantly augmenting liabilities.

A. L. BAKER.

The Chilled Cast Iron Slip Tire.

The economy of any mechanical arrangement will be 1 must depend upon the expense of its first application. This reduction and subsequent maintenance; its safety against sudden failure, and on its duration for constant service. Many years ago a valuable improvement was made and introduced upon the Baltimore and Ohio railroad. Without any noisy pretension, there, to be thing sustained itself, and it has now become a permanent part of the motive power of that great railroad. This improvement was the application of the cast iron tire, confined without strain, to a cast iron wheel. Upon every point in which the merits of any mechanical application may be discussed, the chilled tire has proved its superiority over the wrought iron tire.

Its first cost on the present engine stock of the Baltimore and Ohio railroad, is \$40,000 less than if wrought tires had been adopted; its yearly

saving in expense for maintenance is from \$25,000 to thirty thousand dollars. In the use of the chilled tire, experience in the use of nearly or quite

500 of these tires upon that road, but two have ever broken through the rim, and these were among the first used. The duration of the tire is equal to the best wrought tires, and in the particular case of the Baltimore and Ohio road exceeds their duration.

Its safety under all the circumstances of severe shocks, hard wear, and intense frosts, is unquestioned. Its adhesion is ample, as is attested by the fact of the substitution of six chilled tires in place of eight wrought iron tires under all the heavy burthen engines of the Philadelphia and Reading, and the Baltimore and Ohio railroads. The whole chilled wheel, (which presents the same wearing surface as the chilled tire, but is infinitely inferior in point of economy),

now becoming very generally used on the New England roads, and so far as its service and efficiency are concerned, it gives the best satisfaction.

The removable tire is the only economical application of the chilled surface, and the present patent method of its attachment as adopted on more than one hundred of the Baltimore and Ohio

engines, is the most elegant and affords the most security, when compared with any plan yet tried.

This tire is recommended particularly for freight and depot engines.

Hudson River Railroad.

The election for directors of the Hudson River railroad, was held on the 13th inst., and the following gentlemen were chosen: Messrs. Jas. Hooker of Poughkeepsie, Erastus Corning of Albany, John Wilkinson of Syracuse, James F. Syth, of Kingston, Nelson J. Beach, of Poughkeepsie, and Edwin D. Morgan, Henry Young, Jr., David Wolfe, Edward Jones, Moses H. Grinnell, Drake Mills, Joseph Tuckerman, and J. Johnston of New York. And at a subsequent meeting of the board, Edwin D. Morgan, was elected president, Nelson J. Beach, vice-president, Thomas M. North, secretary, and John M. Kins, treasurer.

Cleveland, Medina and Tuscarawas Railroad.

This company was incorporated in 1851, under the name of Coshocton, Wooster and Cleveland railroad company, but the name was subsequently changed as above.

The route of this road commences at Rawsonville, Grafton, on the C. C. & C. railroad, 25 miles from Cleveland, thence runs to Medina, 13 miles, thence to Seville, to Dalton, to Dover, to New Philadelphia, thence to a point on the Ohio river, opposite Wheeling. The length of the proposed road will be 130 miles.

This road will cross the C. Zanesville and Cincinnati railroad near Orrville; the Penn. and Ohio railroad is at Fairview, and the Steubenville and Indiana railroad near New Philadelphia.

There are now under contract 41 miles to Dalton, thence to be completed to that point ready for the use by the first of May, 1854. It is expected the road will be open and cars running to Medina by the 1st of January next.

The following will show some of the characteristics of the line:

Miles.

Length of line.....

Length of straight line.....

Length of curved line.....

Degrees of curvature.....

Percentage of curved line.....

14.100

The average cost of the road from Grafton to Dalton—where it enters the coal fields—fully equipped and provided with station buildings, all in a first rate manner it is estimated will not exceed \$14,575 per mile.

Winchester and Alabama Railroad.

From the second annual report of the directors of this road, we learn that upon that portion of its line, lying within the state of Tennessee, one-half the grading has been completed; the masonry entirely, and the bridging nearly finished, and that no obstacle now exists to an early completion of the road.

The means applicable to the Tennessee portion of the line are as follows:

Stock subscribed by the Town of Winchester.....	\$25,000
Stock subscribed by the Town of Nashville.....	50,000
Do do do Individuals.....	44,500
and a state loan of \$8000 per mile.....	192,000
	\$311,500

The estimated cost of the Tennessee portion of the road, 24 miles, is \$279,200, to which is added \$10,000 for equipment.

The road is to be extended into Alabama, to meet with the Memphis and Charleston railroad at some convenient point east of Huntsville. The Alabama portion of the line will be about twenty miles long. This portion of the line has been surveyed, and will probably be placed under contract without delay.

Ohio.

Cincinnati, Wilmington and Zanesville Railroad.—The annual meeting of the stockholders of this road was held in Circleville on the 19th inst. Directors of last year were unanimously re-elected. They are F. Corwin and L. Fitzhugh, of Franklin county; D. McLean, of Lafayette; W. A. Sublette, of Pickaway; W. Medill and D. Tallant, of Fairfield, and J. A. Adams, of Muskingum, who M. B.

Mr. Corwin was unanimously re-elected President, W. M. Triplet, Secretary, and J. Radabaugh Treasurer. We learn that the road is expected to be completed to Zanesville by the fourth of July, 1854.

Railroad Items.

The Grand Jury of Beaver county, Penn., has recommended the County Commissioners to subscribe one hundred thousand dollars to the stock of the Cleveland and Pittsburg railroad.

The Directors of the Binghamton and Utica railroad have elected Alfred Munson, of Utica, President; Edward Tompkins, Vice President, and J. M. Towler, of Waterville, Secretary.

The city of Milwaukee has voted in favor of loaning the city credit for two hundred thousand dollars to the Fond du Lac and Oshkosh railroad. The vote was 746 in favor to sixteen against the measure.

The election in Buffalo for loaning the credit of the city to the Buffalo and Pittsburg railroad, has resulted in a majority of two hundred in favor of the loan.

The second branch of the Baltimore City Council have passed the ordinance to guarantee the bonds of this road for one million dollars, which had previously passed the first branch.

The Peru and Indianapolis railroad to Tipton, 40 miles, will be completed this week, and the business upon it is remarkably large for an incomplete line, over one hundred passengers daily passing over it. For a distance of 28 miles the road has been in operation for some time. The whole line to Peru will be finished and in operation early in the coming fall.

The business of the Madison and Indianapolis railroad continues good, and notwithstanding the competition of other lines, will for the current six months ending with the present month, show a handsome increase over the corresponding period of last year. The usual semi-annual dividend will be declared next week.

The second annual report of the chief engineer of the Syracuse and Binghamton railroad, states that an average of fifteen hundred men have been employed on the heavy sections of the road since November last, and that there is no doubt that the road bed will be ready for the rails by the first of September next. The contracts for grading and masonry were let in July last, in three divisions of 25, 29, and 27 miles each. The estimated cost of the road is \$1,809,095.

The directors of the Junction railroad of Ohio, were re-elected last week in general meeting of the stockholders at Elyria. At the same time Judge Lane and E. C. Litchfield were made commissioners to settle the details of consolidation with the Norwalk and Toledo.

A meeting of merchants was held in Philadelphia, on Monday, to take into consideration the propriety of subscribing to the capital stock of the Maysville and Big Sandy railroad company, in Kentucky. A committee was appointed to obtain the requisite amount by private subscription.

The entire issue of \$200,000 by the Wilmington and Manchester railroad, 7 percent. Second mortgage bonds has been negotiated, so as to justify the immediate completion of the road.

James C. Hall, Esq., has been chosen president of the Ohio and Penn. railroad, in place of A. T. Ellis, resigned.

Cumberland and Pennsylvania Railroad.

A company has recently been organized for the construction of a railroad from Cumberland, Md., to the Pennsylvania state line, and the following gentlemen chosen directors, viz: John M. Forbes, of Boston, John F. Winslow, of Troy, Warren Delano, and J. B. Varnum, of New York, and John A. Graham, of Mount Savage. The charter of this company authorizes the construction of a road from Cumberland to the Pennsylvania line, and also of lateral roads extending in any direction from the main line. Under a recent amendment the company are authorized to purchase the railroad owned by the Mount Savage company, running from Cumberland to the mines at Frostburg. Arrangements have been made to consummate this purchase, with a view to the extension of the Mount Savage road from a point about five miles from Cumberland to the Pennsylvania line, there to connect with the contemplated road from Chambersburg, through Bedford to the same point.

The new company also intend to extend the Mt. Savage road to Lonaconing, the George's Creek Valley, passing over the Frostburg hill by means of an inclined plane. When this road is completed the coal of the George's creek valley will be afforded an outlet to the Chesapeake and the Ohio canal by a continuous railroad of about 23 miles in length.

Concord Railroad.

We have the twelfth annual report of this company, for the year ending March 31, 1853, which presents the following statement of its affairs:

Receipts of the road.....	\$305,805 66
Expenses.....	168,968 67

Leaving a balance of..... \$141,836 99

From which was paid for tax on capital stock...	\$10,003 44
---	-------------

Two dividends of 4 per cent each.....	118,800 00
---------------------------------------	------------

Manchester and Lawrence Co., on apportionment of joint through business.....	3,500 00—\$132,308 44
--	-----------------------

Balance to deterioration and contingent account.....	\$9,588 55
--	------------

Expenses on construction account for the year.....	\$10,924 00
--	-------------

Total expenditure on construction account to date.....	1,409,097 79
--	--------------

Leaving an unexpended capital of.. \$75,902 21

From which, deducting loan to Portsmouth road, there is a balance of.....	25,902 21
---	-----------

The tonnage for the year has been 76,711 tons up, and 173,250 down; in all 249,961 tons. Passengers carried one mile 4,987,342, or equal to 14,560 over the whole road.

New York and Erie Railroad.

Homer Rems dell, Esq., of Newburg, has been appointed President of the N. Y. and E. railroad, to fill the vacancy occasioned by the resignation of Mr. Loder.

"Gardner's Rock Drill."

DESIGNED for Tunnelling, Quarry use, and Rock Excavations of all descriptions, by the use of which a saving of 50 to 75 per cent is made.

Applications for Territorial Rights and Machines must be made to the Patentee.

G. ARTHUR GARDNER,
Trinity Buildings, Broadway,
New York,
June 9, 1853.

Notice to Contractors.

CATTAWISSA, WILLIAMSPORT AND ERIE RAILROAD.

SEALED proposals will be received at the Engineer's Office, in Cattawissa, Columbia Co., Pa., until the first day of July next, for the Grading, Masonry, and Track-laying of that part of the Cattawissa, Williamsport and Erie railroad, extending from Cattawissa to Milton, a distance of about 25 miles.

The work will be divided into sections of about one mile in length, and profiles, &c., of the work will be seen at the Engineer's Office in Cattawissa for ten days previous to the day of letting.

THOMAS A. EMMET,
Chief Engineer.

Valuable Works on Engineering, Mechanics, Railways, Steam Engines, etc.

CRESY'S ENCYCLOPEDIA OF CIVIL ENGINEERING	\$17 00
MAHAN'S ELEMENTARY COURSE OF CIVIL ENGINEERING	3 00
MILLINGTON'S ELEMENTS OF CIVIL ENGINEERING	3 50
GREGORY'S COMPLETE COURSE OF CIVIL ENGINEERING	2 00
LAWS' RUDIMENTARY CIVIL ENGINEERING, in 3 parts	94
DEMPSEY'S PRACTICAL RAILWAY ENGINEER	11 00
QUESTED'S RAILWAY SURVEYING	1 75
RITCHIE ON RAILWAYS	1 75
LECOUNT'S RAILWAYS—Their Construction and Management	1 37
WHISHAW'S RAILWAYS OF GREAT BRITAIN AND IRELAND	7 00
BORDEN'S FORMULE FOR CONSTRUCTING RAILROADS	2 50
TRAUTWINE ON RAILROAD CURVES	1 00
Do. ON EXCAVATIONS AND EMBANKMENTS	1 00
(LIST TO BE CONTINUED.)	

** A large assortment of Engineering and Mechanical Works kept constantly on hand, and all new works received as soon as published.

JOHN WILEY,
Importer, Publisher and Bookseller,
167 Broadway, New York.

June 16, 1853.

GREAT WESTERN MAIL LINE.—**SIXTY** MILES DISTANCE SAVED, by taking the **MICHIGAN SOUTHERN AND NORTHERN INDIANA RAILROAD**.—Through tickets for Chicago, St. Louis, Milwaukee, Racine, Kenosha, Waukegan, and Sheboygan, by New York and Erie Railroad via Dunkirk, and Buffalo and New York City Railroad; People's Line of Steamboats; Hudson River Railroad, via Buffalo, connecting at Buffalo with the splendid steamers **EMPIRE STATE**, J. WILSON, Commander, Mondays and Thursdays; **SOUTHERN MICHIGAN**, D. PERKINS, Commander, Wednesdays and Saturdays; **NORTHERN INDIANA**, I. T. TREAT, Commander, Tuesdays and Fridays; leaving Buffalo every evening (Sundays excepted). These steamers are low pressure, built expressly for the Lake trade, and for finish, speed, strength and safety, have no superiors anywhere.

The connections with the Express Trains at Toledo and Monroe, for Chicago and St. Louis, are perfect, and can be relied upon.

Forty hours from New York to Chicago. Time and money saved by taking this Line.

Passengers preferring it, can take the Lake Shore Railroad to Toledo, the Michigan Southern and Northern Indiana Railroad to Chicago, thence by the Rock Island Railroad to La Salle, forming the only continuous line of Railroad to the Illinois river.

For through tickets or freight apply to

JOHN F. PORTER, Agent, 103 Broadway, cor. Dey st.

RICHARD NORRIS.

HENRY LATIMER NORRIS.

Richard Norris & Son,
NORRIS' LOCOMOTIVE WORKS, BUSH HILL,

PHILADELPHIA.

MANUFACTURE to order Locomotives, exclusively, on any plan, or of any size—or best material and workmanship. Their Works having been this year greatly enlarged, and furnished with the most approved Tools, they are enabled now, having a large number of Workmen employed, to execute orders with despatch.

June 9, 1853.

To Engineers and Steamboat Captains.

EXPLOSIONS PREVENTED!

BRANDS' LIQUID,
FOR DISSOLVING INCRUSTATIONS IN STEAM BOILERS.

BRANDS' LIQUID is the name of a fluid recently in use throughout all Europe, by the application of which the incrustations in Steam Boilers are dissolved or totally avoided, without affecting in the least the material of the boiler.

Chemical examinations and experience have fully ascertained that, by the application of this fluid, no harm whatever is done to the material of which the boiler consists.

To dissolve the hardened incrustation in Steam Boilers, pour every 10 or 14 days, in proportion as the boiler is daily for a longer or shorter time heated, the quantity of Brands' Liquid to the water in the boiler as shown in the following table:—

TABLE FOR CLEANING INCRUSTED BOILERS.

STEAM BOILERS.

Which are daily from 10 to 16 hours heated, and which have a power of evaporation of

	From	1 to 10 Horse Power,
"	10 to 20	"
"	20 to 30	"
"	30 to 45	"
"	45 to 65	"
"	65 to 110	"
"	110 to 160	"
"	160 to 220	"
"	220 to 300	"
"	300 to 400	"
"	400 to 500	"

QUANTITY

OF BRANDS' LIQUID wanted.

Every 10 to 14 days.	| Per year—Barrel of 40 gall.
4 to 6 Quarts,	1 1/2 "
6 to 9 "	1 1/4 "
7 to 10 "	2 "
10 to 14 "	2 1/2 "
12 to 17 "	2 1/2 "
13 to 19 "	2 1/2 "
15 to 21 "	3 "
18 to 26 "	3 1/2 "
20 to 29 "	3 1/2 "
22 to 31 "	4 "
24 to 35 "	4 1/2 "

If Brand's Liquid is regularly used, the incrusted Boilers are within three to five months clean; and to prevent any further incrustation in such new Boilers, the use of Brand's Liquid must not be interrupted, but about two-thirds of the stated quantities in the table given to the water in the Boilers.

The Boilers of Locomotives require every two days, in proportion to their power and time of service, only two and a half to four quarts of Brand's Liquid, which every second day is poured into the water in the Tender.

As often as the water in the water-gauge, on Stationary, Ship or Locomotive Boilers, becomes of a muddy appearance, the Boiler must be blown out and cleansed from the stones and dirt which have settled to the bottom of the Boiler.

The incrustation which in this manner is removed is soft, or in pieces, which are commonly of a crumbling and brilliant texture and have a brown color.

In some parts of the country, and in Marine Boilers, the incrustation is often very hard, and to remove this, the larger quantities in the given table are required. The pieces of this incrustation which are removed by the use of Brand's Liquid have lost their glassy texture, and though they commonly retain some hardness, they have a brown color, and a corrosive and decayed appearance.

To remove the incrustation of Marine Boilers, larger quantities of Brand's Liquid are required, in proportion as by the removal of the brine a quantity of the feed-water is blown out. By any simple contrivance Brand's Liquid must be brought into the boiler in small portions, or mixed with the feed water.

Brand's Liquid is not injurious to the Boiler if it is used in large quantities, even if the Boiler is entirely filled with it and heated, but, in general the quantity as is stated in the table must not be exceeded, because in connection with large quantities of incrustation the Liquid generates much priming and motion of the water, which might prove injurious to the annexed machinery, especially in Ship Boilers and Locomotives which have no large steam-chests.

The above table is made by practical experience, so that only a gentle working of Brand's Liquid is allowed, entirely free from any danger, for the Boiler once properly cleaned, the proprietor will by experiments easily ascertain the minimum quantity of Liquid that is required for the Boiler.

Should it be required to clean old incrusted Boilers by the use of Brand's Liquid in a few days, then it is only necessary to pour one-half to three-fourths of a hoghead at once into the water of the boiler, and heat it from six to eight days gently to boil heat, for which operation the Boiler must be put out of service.

In Locomotives where the steam-chests are small, Brand's Liquid must be used oftener in small quantities as before said.

A Locomotive out of service may be cleaned within 6 or 8 days by the use of a large quantity of Brand's Liquid, (one-fourth one-half a hoghead).

It would be needless to enter into a long discussion on the advantages in using Brand's Liquid for cleaning steam generators, being fully aware that it destined for the use of the most important part of the public, and it may therefore suffice to mention its advantages in a few words, as follows :

1. Less repair of Boiler.
2. Increased generation of steam, or saving of fuel.
3. The expense of hammering and loosening the incrustation is saved.
4. Less interruption of business.
5. The Boilers remain tighter.
6. The duration of the Boilers is increased, especially of Locomotives and Tube-Boilers in general.
7. Three-quarters of the causes of Boiler-explosions are removed.

Price per barrel \$20.

The patentees are so confident of the merits of this invention, that they offer one barrel gratis to parties willing to make a trial, to be paid for, only in case of success and of future orders.

Brand's Liquid is used with the best effect by the Cincinnati Water Works, and many other establishments in the West.

Address BRAND, BROTHERS, Toledo, Ohio.

Sole Patentees both in Europe and the United States.

Or, F. DUFAL, 43 New Street, New York.

May 23, 1853.

The Troy Iron Bridge Co.

A. B. prepared to erect Iron Bridges or Roads, or any kind of bearing trusses, girders, or beams, to span one thousand feet or under, of any required strength, in any part of the country. Their bridges will be subjected to severe tests, and can be built for about the price of good wooden ones.

BLANCHARD & FELLOWES, Troy, N. Y.

April 1st, 1853.

Etna Car Works.

HILLMEYER & SMALL, YORK, PA., PROPRIETORS.

WE are manufacturing to order and by contract, Baggage, Freight, Express, Stock, "Reading," and other patterns of Coal Cars, Lumber and Gravel Cars, of every variety, at short notice, and on favorable terms.

Our facilities for manufacturing are extensive, and our means for transportation to all parts of the country speedy and economical.

The Wheels we use receive our own personal attention, are made of the best *Cold Blast Charcoal Iron*, of both spoke and plate patterns, solid and open hubs.

All Cars built by us, and now in daily use on the Pennsylvania, Central, Baltimore, Susquehanna, York and Cumberland Roads, have been appraised as first class, and carry the largest capacity allowed on any roads. We are prepared to furnish Wheels and Axles separately or fitted, Springs and other parts of Cars at short notice. Orders and Contracts for Railroad Companies solicited.

May 20th 1853.

To Railroad Co's, Locomotive Builders and Engineers.

THE undersigned having taken the Agency of Mr. CROFT'S Steam Gauge, would recommend its adoption by those interested. They have been extensively used on Railroads, Steamers and Stationary Boilers, where, from their accuracy, simplicity, and non-liability to derangement, they have given perfect satisfaction. In fact, for Locomotives, they are the only reliable Gauge yet introduced.

CHAS. W. COPELAND, Consulting Engineer, 64 Broadway.

Railroad Iron.

THE undersigned, Agent for the Manufacturer, is prepared to contract for T Rails, of the usual pattern and weights, to be delivered on board ship in Wales.

He will also receive and forward orders for purchase of Railroad Iron and Metals generally, through the medium of his friends in London.

For terms, apply to JOHN H. HICKS,

90 Beaver St.

April 1, 1853.

Gerard Ralston,
21 TOKEN HOUSE YARD, LONDON,
OFFERS HIS SERVICES FOR THE
PURCHASE AND SALE OF
AMERICAN SECURITIES,
COLLECTION OF DIVIDENDS,
DEBTS, LEGACIES, ETC.,
And for the Purchase and Inspection of
Railroad Iron, Chairs, or
any kind of Machinery.

REFERENCES:

Messrs Palmer, McKillop, Dent & Co., London.
" George Peabody & Co., London.
" Curtis, Bouve & Co., Boston.
Richard Irvin, Esq., New York.
Robert Ralston, Esq., Philadelphia.
C. C. Jamieson, Esq., Baltimore.

38

To Contractors.

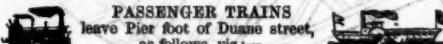
SEALED PROPOSALS will be received at the Engineer's office of the Lexington and Big Sandy Railroad, in Mt. Sterling, Ky., until Aug. 10th, at sun down for the graduation and masonry of the whole of said Railroad, a distance of 125 miles. Bids will be received for any number of sections, the company reserving the right to reject all propositions, if none are satisfactory.

Propositions are also invited by contractors of ability, for the whole road.

This road runs through some of the finest portions of the State, the facilities for the supplies of every kind being very abundant.

Plans and specifications may be seen at the office after July 1st.

J. B. WESTBROOK, Chief Engineer.
Portland, April 9, 1853.

New York and Erie R. R.

PASSENGER TRAINS leave Pier foot of Duane street, as follows, viz:—

BUFFALO EXPRESS, at 6 a. m. for Buffalo direct, over the N. Y. and E. R. R., and the Buffalo and N. Y. City R. R., without change of baggage or cars.

CINCINNATI EXPRESS, at 6 a. m. for Dunkirk.

MAIL, at 8 a. m. for Dunkirk and Buffalo, and all intermediate stations.

WAY, at 3.30 p. m. for Delaware and all intermediate stations.

NIGHT EXPRESS, at 6 p. m. for Dunkirk and Buffalo.

EMIGRANT, at 8 p. m. for Dunkirk and all intermediate stations.

On Sundays only one Express Train—at 6 p. m.

The Express Trains connect at Dunkirk with the Lake Shore Railroad for Cleveland, Cincinnati, Chicago, etc., and at Buffalo with first class splendid steamers for Cleveland, Sandusky, Toledo, Detroit and Chicago.

CHAS. MINOT, Sup't.

To Contractors.

PROPOSALS for grading, masonry, and bridging of the Western Division of the Covington and Ohio railroad will be received at the office of the Engineer, at Guyandotte, Cabell county, Virginia, between the twentieth and thirtieth of June next.

They will embrace about 45 mile sections with Bridges over Twelve Pole, Guyandotte and Mud rivers.

Also between the 1st and 15th of July next, proposals will be received at Covington, Virginia, for the Grading, Bridging and Masonry of that portion of the Eastern Division, lying between the town of Covington and Hayne's farm, on Jackson river—a distance of 10 or 11 miles of very heavy work, including much heavy retaining wall, two large bridges over Jackson's river, and probably two tunnels.

The successful bids will be declared as soon as practicable after the 15th of July. Contractors will be required to commence the work at once, and finish within a year. Plans and specifications will be ready between the twentieth and thirtieth of June—names of securities must be given in the Bid.

By order of the Board of Public Works.
CHAS. B. SHAW,
Chief Engineer of the Cov. & Ohio R. R. Co.,
Lewisburg, Virginia.

To Contractors.
HUNTINGTON AND BROAD TOP MOUNTAIN RAILROAD.

PROPOSALS will be received at the Engineer's Office, Huntington, Penn., until the 28th day of June next, for the graduation and masonry of thirty-five miles of the above railroad.

Plans and Specifications will be exhibited in the Office for three days previous to the letting.

S. W. MIFFLIN, Engineer.

PACIFIC RAILROAD LOAN.
\$4,000,000 LoanON THE
MORTGAGE BONDS OF THE PACIFIC RAILROAD COMPANY OF MISSOURI.

THIS Company will receive proposals until the 11th of July next, for four millions of dollars of their construction bonds, to be issued in sums of one thousand dollars each, payable at the city of New York twenty years after the date thereof, with coupons attached for the payment of interest at the same place semi-annually, on the first of January and first of July in each year, at the rate of 7 per cent per annum.

These bonds are secured by a first and only mortgage on the Southwestern Branch railroad, 300 miles in length, and one million of acres of land on the line of that branch, granted by Congress to aid in its construction: and also by second mortgage on the Pacific railroad, 290 miles in length. About 130,000 acres of land, not included in the mortgage are set apart to aid in meeting interest.

Forty miles of the Pacific railroad, from St. Louis westward, is about completed, and 85 miles further, reaching Jefferson city, the capital of the state, is under construction. About \$1,600,000 has already been expended by the company in the completion of the first division, and in the construction of an excellent machine and car shop, and engine house, and the necessary real estate, and the surveys required to prepare the whole 600 miles of railway for contract.

The Pacific railroad line extends from St. Louis to the vicinity of Independence, near the mouth of the Kansas, 290 miles, and its southwestern branch diverges about forty miles west of St. Louis, and runs near Springfield to the southwestern part of the state, a little north of Ta-le-quah, the capital of the Cherokee nation, 300 miles.

The charter was granted with the view, and the right, of ultimate extension to the Pacific Ocean, with an authorized capital of ten millions, and privilege of increase under general law.

Capital subscribed in Missouri over \$2,000,000, of which about 40 per cent. is paid up. State loan to the company authorized \$4,000,000, of which \$700,000 has been issued and sold at a premium. For such stock now issued, the state holds a lien on the Pacific railroad only. Land granted by Congress, now the property of the company, about 1,250,000 acres.

One or the other of the lines of this company will be the Central National line of railway to the Pacific ocean. Reconnoisances and surveys of the United States government will connect with both.

The whole amount of bonds which can be issued under the mortgage is ten millions of dollars. The whole of these bonds are convertible into land of the Company, and one-half into stock of the Company, within a limited time, at the option of the holder.

The Company reserve the right to accept proposals for all or any portion of the amount.

Ten per cent of the amount allotted to each subscriber will be required on notice of the acceptance of his proposals, and the balance as called for by the Directors, not exceeding ten per cent monthly. Any subscriber may, however, at his option, pay up in full, and receive his bonds at any time.

Interest will in all cases be adjusted, on payment of the final instalments.

Proposals will be received at the office of Messrs

Riggs & Co., 56 Wall street, N. Y., inclosed, sealed and endorsed, "Proposals for Loan of \$4,000,000 of Pacific Railroad of Missouri." Laws, Reports, Documents and Map, showing the condition, relations and prospects of the work, and all necessary information relative to its affairs, &c., may be obtained after the 1st of June on application to Messrs. GAIMANN & Co., or Riggs & Co., at 56 Wall street, or the subscriber, personally, or by letter.

By authority of the Board of Directors,
THOMAS ALLEN, President.
St. Nicholas Hotel, N. Y., May 20, 1853.

Pease & Murphy,
FULTON IRON WORKS,
FOOT of Cherry st., E. R. Office, 21 Corlears,
corner of Cherry st. Manufacturers of Land
and Marine Engines.

N. B. Engines and Boilers repaired. 6d

Notice.

LITHOGRAPHY.—The Court having granted the petition of the undersigned for a dissolution of his partnership with ALPHONSE BRETT, trading under the firm of A. BRETT & CO., Lithographers, Philadelphia, and having removed from Goldsmith's Hall to that convenient business stand, the new Girard building, No. 50 South Third Street, he would therefore beg leave to inform his friends and the public, that he is prepared to execute lithography in all its branches, in a superior manner. Having the best artists and workmen employed, he can freely warrant his work as equal to any in the trade.

Publishers, civil engineers, machinists, and others requiring lithographs, plain or in colors, can depend on the correctness and high finish of their designs, along with promptness and despatch.

DAVID CHILLAS.

Ap 1 m

50 South Third street.

NEW YORK
Lubricating Oil Manufacturing Co.
12 BROADWAY.

PROPRIETORS AND MANUFACTURERS OF
DEVLAN'S PATENT LUBRICATING OIL,
FOR ALL KINDS OF MACHINERY AND RAILROADS.

THIS OIL is now extensively used on the principal Railroads in Pennsylvania, New York and N. E. States. It runs machinery with less friction, thereby enabling the consumer to accomplish more with the same motive power, and save their machinery from unnecessary wear. It is entirely free from Gum, and will cleanse and destroy all old Gum that has accumulated upon Slides and Journals, by the use of bad oil. It will wear longer than Sperm, and is from thirty to forty cents a gallon cheaper, which makes a great saving to the consumer.

Ap 20 m

To Railroad Track-Layers.

PROPOSALS, under seal, are requested at the Railroad Journal office, New York, on the 10th July next, for laying the track of the Mobile and Ohio, Tennessee and Alabama, and Paducah and Tennessee railroads;—aggregate length, 512 miles. Plans, specifications and other required information, will be furnished at the time and place above mentioned.

JOHN CHILDE,

Chief Engineer.

MOBILE, May 17th, 1853.

Notice to Contractors.

PROPOSALS will be received until noon the 20th June, for the Graduation and Masonry of the Franklin and Warren Railroad, extending from a point on the eastern State Line of Ohio, in the County of Trumbull to Ashland, Ashland county, Ohio, a distance of about 106 miles.

The line will be ready for examination June 18th. For particulars apply at the Engineer's office, Franklin, Portage county, Ohio.

The remaining distance of the road extending from Ashland to Dayton, or Mayville, will be ready in a short time.

M. KENT,

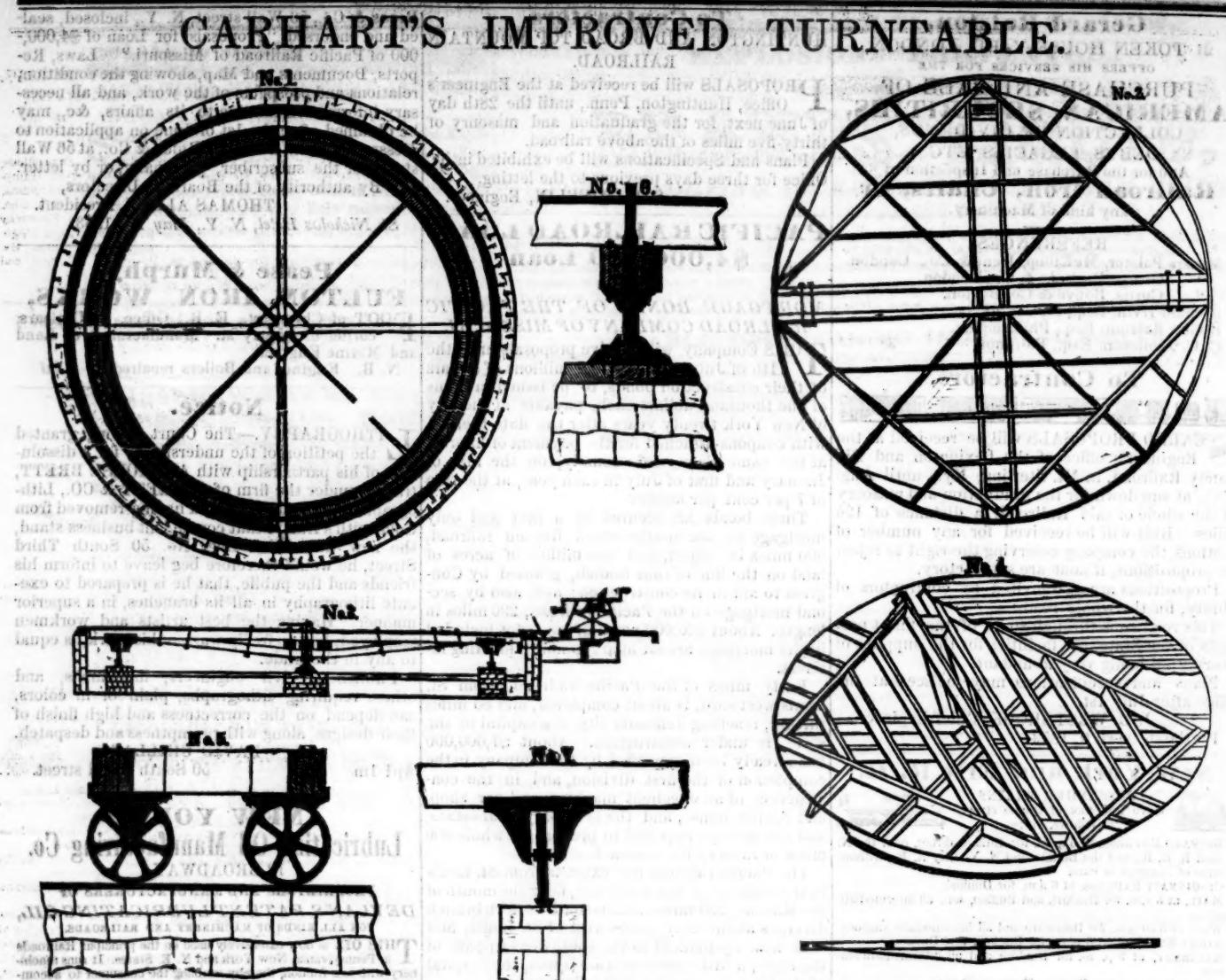
President F. & W. Railroad.

SAM'L H. KNEASS,

Chief Engineer.

FRANKLIN, May 19, 1853.

3000 m



THIS TURNTABLE, together with an Engine and Tender of 30 tons weight, is capable of being turned by **ONE MAN in 25 SECONDS**.

The Patentee of this Improved Table would solicit an examination by those Railroad Companies which have not tried its merits. It is guaranteed to be the cheapest and most durable one now in use; its simplicity rendering it impossible to get out of repair, unless it is placed upon treacherous foundations. The whole cost, ready for use, was formerly \$1,300 apiece; this included all the workmanship and materials, which were the best that could be furnished, with the exception of excavating the pit and furnishing the rail for the tracks. At the present time, owing to the rise in Iron, and the scarcity of stone at some points, the subscriber is compelled to ask a small advance on the above mentioned price. Should it suit the pleasure of any to enter with the subscriber for further particulars,

or inquire into the practical utility of the Table as and smooth. The centre pier is of stone, with a steel step for the screw and pivot bolted to the same.

Hudson River R. R. Co.,

S. W. Roberts, Esq., Chief Engineer of the Ohio and Penn. R. R., at Pittsburgh, Pa.

O. Barnes, Esq., Resident Engineer of the Central Pennsylvania R. R., Pittsburgh, Pa.

J. Durand, Esq., Sup't of Cleveland and Pittsburgh R. R.

Wm. E. Ferguson, Esq., Chief Engineer of Toledo, Norwalk and Cleveland R. R., Cleveland, O.

A. J. Conover, Esq., Chief Engineer of Columbus, Piqua and Indiana R. R., at Piqua, O.

Fig. 1, of the above cut, represents the Foundations, consisting of the Bank and Track Walls, the latter made of cut, and the former of hammer-dressed stone, with a cut coping. The Track is spiked and leaded to the stone wall, and cut perfectly level

Fig. 2, shows the Carcass Framing.

Fig. 3, is a side view of one Main Truss, with the mode of gearing, including the mitre-wheels, and iron crank frame, rack and pinion.

Fig. 4, gives a perspective view of the rim, segments, decking, etc.

Fig. 5, is an end view of the main trucks, with pedestals and wheels.

Fig. 6, is the screw for the pivot, 6 inches in diameter, working in a steel step through a nut for adjustment.

Fig. 7, shows a cross section of the track wall, well and pedestal.

For further particulars, please address

D. M. CARHART,
Cleveland, Ohio.

February 14, 1853.

LAHAYE'S Patent Self-acting Brake.

THE attention of Railroad Companies is respectfully called to this improvement, used exclusively on all Passenger Cars upon the Philadelphia and Reading Railroad, and now being attached to those building for the Camden and Atlantic Railroad, and several other Roads.

Lahaye's Self-acting Brake can be attached to any Car without interfering with the ordinary Hand Brake, is simple in its construction, and reliable in its action.

By trials made with this Brake, Passenger Trains, at a speed of 30 miles per hour, have been brought to rest within a distance of 250 feet.

For Right to use, or any other information, apply to
O. A. NORRIS,
American Railway Agency, 12 Farnham Building,
May 20, 1852.

To Engineers, Architects and Draughtsmen.

THE undersigned begs respectfully to inform Gentlemen in the above professions, that he has constantly on hand a great variety of Instruments for Field and Office use.

JAS. PRENTICE,
1 Chamber St., N.Y.

Oxford Furnace, N. J.

ESTABLISHED A. D. 1743.

THE Subscriber manufactures and keeps constantly on hand for sale, every variety and size of Railroad Wheels, made from the celebrated Oxford Iron. All orders addressed to CHAS. SCRANTON, Oxford Furnace P. O., will be attended to promptly.

Sept. 11, 1852.

ly*

IRON.

Pierson & Co.,

24 BROADWAY, NEW YORK,

KEEP on hand a large and general assortment of ENGLISH and AMERICAN, Refined, BAR, BOLT, SHEET and SHAFTING IRON, especially manufactured for LOCOMOTIVE and CAR BUILDERS, and RAILROAD MACHINE SHOPS; also, Boiler Plates and Rivets, Sheet, Cast and Spring Steel.

Locomotive Cranks, Axles, Tires and Tire Bars, of the B. O. LOWMOOR, and other approved makes imported to order on the most favorable terms.

February 14, 1853.